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CENTRAL INTELLIGENCE AGENCY

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C-O-N-F-I-D-E-N-T-I-A-L

COUNTRY Hungary

REPORT

SUBJECT Survey of the Hungarian Electric Power Industry

DATE DISTR. 1 MAY 1958

NO. PAGES 145

REFERENCES RD

25X1

12 MAY 1958

DATE OF INFO.

PLACE & DATE ACQ

TF/SP

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Attached to the enclosure is a map, representing Page 30 of the enclosure, showing electric power transmission lines and power stations in Hungary.

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STATE	#X	ARMY	#X	NAVY	#X	AIR	#X	FBI		AEC			ORR	EV		

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REPORT

COUNTRY Hungary

SUBJECT Survey of the Hungarian Electric Power Industry

DATE DISTR. 17 Apr. 1958

NO. OF PAGES 145

DATE OF INFORMATION

PLACE ACQUIRED

REFERENCES:

25X1

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SURVEY OF THE HUNGARIAN ELECTRIC POWER INDUSTRY

Table of Contents

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INTRODUCTION

This report contains [redacted] detailed information concerning the Hungarian electric power industry and its division into three grids. 25X1

[redacted] 25X1

Listed below are locations mentioned throughout this report; included are the geographical and UTM coordinates where available:

Locations	Geographical Coordinates	UTM Coordinates
AJKA	(N47-06, E17-34)	(UTM XN-9420)
ALSÓGALLA	(N47-34, E18-25)	(UTM XM-8765)
BÁNHIDA	(N47-34, E18-23)	(UTM CT-0272)
BAZAKERETTYE	(N46-32, E16-45)	(UTM XM-3468)
BEKESCSABA	(N46-39, E21-05)	(UTM ES-0679)
BUDAFOK	(N47-25, E19-02)	(UTM CT-5254)
BRENNBERGBANYA	(N47-39, E16-30)	(UTM XN-1479)
DIOSD	(N47-24, E18-57)	(UTM CT-5246)
DIOSGYOR	(N48-06, E20-41)	(UTM DU-7728)
DISZNOSHORVAT	(N48-18, E20-39)	(UTM DU-7551)
DOROG	(N47-43, E18-44)	(UTM CT-2988)

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Locations	Geographical Coordinates	UTM Coordinates
EDELÉNY	(N48-17, E20-42)	(UTM DU-8149)
EGER	(N47-54, E20-22)	(UTM DU-5505)
EGERCSEHI	(N48-03, E20-16)	(UTM DU-4523)
ESZTERGOM	(N47-47, E18-45)	(UTM CT-2996)
FELSŐGALLA	(N47-32, E18-26)	(UTM CT-0769)
GÖDÖLLŐ	(N47-36, E19-21)	(UTM CT-7776)
GYÖNGYÖS	(N47-47, E19-56)	(UTM BT-2094)
GYŐR	(N47-47, E17-38)	(UTM XN-0785)
HATVAN	(N47-40, E19-41)	(UTM DT-0080)
HEGYESHALOM	(N47-55, E17-10)	(UTM XP-6109)
HEJŐPAPI	(N47-51, E20-25)	(UTM DU-9205)
HERBOLYABÁNYA	(N48-13, E20-36)	(UTM DU-6736)
HIDAS	(N46-15, E18-29)	(UTM CS-0242)
IKERVÁR	(N47-12, E16-53)	(UTM XN-4329)
INOTA	(N47-12, E18-10)	(UTM BT-8731)
KAZINCBARCIKA	(N48-15, E20-38)	(UTM DU-7346)
KECSKEMÉT	(N46-54, E19-41)	(UTM DS-0096)
KESZTHELY	(N46-46, E17-14)	(UTM XM-7181)
KIRÁLD	(N48-15, E20-24)	(UTM DU-5546)
KISKUNFÉLEGYHÁZA	(N46-43, E19-51)	(UTM DS-1174)
KISKUNHALAS	(N46-26, E19-29)	(UTM CS-4383)
KISTERENYE	(N48-05, E19-50)	(UTM DU-1428)
KOMÁROM	(N47-45, E18-06)	(UTM BT-8593)
KOMLÓ	(N46-11, E18-15)	(UTM BS-8919)
KŐSZEG	(N47-23, E16-32)	(UTM XI-1750)
KURITYÁN	(N48-18, E20-16)	(UTM DU-6848)

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Locations	Geographical Coordinates	UTM Coordinates
LILLAFÜRED	(N48-05, E20-37)	(UTM DU-7129)
LŐRINCI	(N47-44, E19-40)	(UTM DT-0189)
LOVÁSZI	(N46-32, E16-33)	(UTM XM-1956)
MÁLYI	(N48-01, E20-40)	(UTM DU-8619)
Mátravidéki Erőmű	(N47-42, E19-40)	(UTM DT-0086)
MEZŐKERESZTES	(N47-49, E20-42)	(UTM DT-7897)
MISKOLC	(N48-06, E20-47)	(UTM DU-8428)
MOSONMAGYARÓVÁR	(N46-27, E18-59)	(UTM XM-5451)
NAGYKANIZSA	(N46-27, E16-59)	(UTM XM-5346)
NYIREGYHÁZA	(N47-58, E21-43)	(UTM EU-5411)
OROSHÁZA	(N46-34, E20-40)	(UTM DS-5577)
ÓZD	(N48-13, E20-18)	(UTM DU-4841)
PÉCS	(N46-05, E18-13)	(UTM BS-8605)
PÉCSUJHEGY	(N46-05, E18-16)	(UTM BS-8907)
PÉTFÜRDŐ	(N47-09, E18-07)	(UTM BT-8127)
PILISVÖRÖSVÁR	(N47-37, E18-54)	(UTM CP-4277)
POLGAR	(N47-52, E21-06)	(UTM EU-0802)
PUSZTAEDERICS	(N46-38, E16-48)	(UTM XM-3767)
RUDOLFTELEP	(N48-16, E20-45)	(UTM DU-7853)
SAJÓSZENTPÉTER	(N48-13, E20-43)	(UTM DU-3575)
SALGÓTARJÁN	(N48-07, E19-48)	(UTM DU-1328)
SOPRON	(N47-29, E46-35)	(UTM XN-1984)
SZEGED	(N46-15, E20-09)	(UTM DS-3324)
SZÉKESFEHÉRVÁR	(N47-12, E18-25)	(UTM CT-0430)
SZENTENDRE	(N47-40, E19-04)	(UTM CT-6581)
SZOLNOK	(N47-10, E20-11)	(UTM DT-3525)
SZOMBATHELY	(N47-14, E16-37)	(UTM XN-2334)
SZONY	(N47-44, E18-10)	(UTM BT-8890)
SZTÁLINVÁROS	(N46-58, E18-55)	(UTM CT-4205)
SZUHAKÁLLÓ	(N48-17, E20-39)	(UTM DU-7549)
TASS	(N47-01, E19-01)	(UTM CT-5209)
TATABÁNYA	(N47-33, E18-26)	(UTM CT-0571)
TISZALÖK	(N48-01, E21-23)	(UTM ET-2919)
TISZAPALKONYA	(N47-53, E21-03)	(UTM EU-0411)
TÖRÖKBÁLINT	(N47-47, E18-55)	(UTM CT-4356)
TISZAOSZLÁR	(N47-52, E21-02)	(UTM EU-0202)

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C-O-N-F-I-D-E-N-T-I-A-L [redacted]

Locations	Geographical Coordinates	UTM Coordinates
VÁRPALOTA	(N47-12, E18-08)	(UTM BT-8331)
VISEGRÁD	(N47-47, E18-58)	(UTM CT-9855)
ZÁHONY	(N48-24, E22-11)	(UTM EU-8761)
ZALAEGERSZEG	(N46-50, E16-50)	(UTM XM-4089)
USSR		
UZHGOROD (UNGVÁR)	(N48-38, E22-17)	(UTM EU-9583)
YUGOSLAVIA		
OSIJEK	(N45-30, E18-46)	
RUMANIA		
BAIA-MARE	(N47-40, E25-35)	

A. ORGANIZATION AND ADMINISTRATION

1. Ministry of Mines and Power (See Annex B.)

The Ministry of Mines and Power (Bánya és Energiaügyi Minisztérium), located at Markó Utca 16, BUDAPEST V, was the responsible governmental agency for directing and controlling the Electric Power Industry. There were several changes in the administrative structure since 1947. The chief changes seemed to be the designation of the Ministry to which the Electric Power Industry was subordinated. From 1947 to 1948 the Electric Power Industry was directly responsible to the Ministry of Heavy Industry (Nehézipari Minisztérium). From 1948 to 1952, the responsible agency was the Ministry of Mines and Power. From 1952 to 1954 the responsible agency was the Ministry of Chemical Industry and Power (Vegyipari es Energiaügyi Miniszterium) located at Marko Utca 16 in BUDAPEST. The responsibility was changed again during 1954 and 1955 to the Ministry of Heavy Industry, Department of Power Plants. From 1955 to January 1957 the responsibility rested again with the Ministry of Mines and Power. From January 1957 [redacted], the over-all control came from the Ministry of Heavy Industry although the Ministry of Mines and Power still existed. The Ministry of Mines and Power was required to meet the demands for fuel and power made by the Ministry of Heavy Industry. The National Planning Office decided on priorities for coal and power. It was an independent organization supervised by the Council of Ministers. 25X1

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2. Administration and Operations

[redacted] A typical daily operation in the Power Plant Trust headquarters was as follows:

0830 to 0900: In the presence of the Power Trust's Director, chief engineer, and chief bookkeeper, the incoming mail was discussed and distributed to the responsible department chiefs with instructions and a deadline for compliance which was noted by the secretary present. Pertinent factors were extracted to be discussed at the meeting of the Department Chiefs.

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0900 to 1000: A meeting of all department chiefs was held. Present were the director, department chiefs or their assistants, and the representatives of the Communist Party and the Trade Union. The incoming reports from the individual power plants were discussed and the department chiefs reported on the previous day's activities. The chief engineer gave instructions for the coming day. All new regulations or instructions originating from other government agencies were made known to the participants. Minutes of the meeting were recorded by the secretary.

1000 to 1100: All departments received visitors on official business, for example: from Ministeriums, power and allied plants.

1100 to 1400: Official business was conducted with construction firms, for example: complaints about delayed schedules, procurement of material, etc.

1400 to 1700: Everybody attended to their respective jobs or duty.

Every department chief had an assistant who substituted in the chief's absence; therefore, continuity was assured under all circumstances. The supervision of the power plants was accomplished by the respective chiefs of the co-operatives or their assistants. They kept liaison with the Budapest industries, the Coal Distribution Trust, and attended to the material procurement on the basis of incoming reports from the power plants. (See Annex C for [redacted] organizational chart of the Power Plant Trust [redacted] for Number 1 Grid High Capacity Power Plants.) 25X1

B. ECONOMIC BACKGROUND

1. Industrial Requirements

It was evident before the first five-year plan (1952 to 1957) that Hungary's existing electric power was inadequate to supply the planned increase in industry. Therefore, an ambitious electric power expansion was projected under the first two five-year plans. In addition, international agreements were made or were being considered with Rumania, Czechoslovakia, and Yugoslavia to help overcome the electric power shortage. In 1956 the Ministry of Heavy Industry established the absolute minimum power requirement for critical Hungarian industries at a steady 1,200,000 kw per hour. This requirement was to be met at all costs. This minimum requirement would conceivably always be met if the Hungarian power plants continued to produce at installed capacity or, as in some cases, above the installed capacity. The established minimum requirement for heavy industry was to be supplied by the three Hungarian grids. (See Annex C for more detailed description of the three grids.) Number 1 Grid would supply 600,000 kw hours, Number 2 Grid 400,000 kw hours, and Number 3 Grid 200,000 kw hours. This was only a theoretic breakdown of the over-all requirement since the output of the power plants in the aforementioned grids was considerably more than the absolute minimum requirements.

Although the minimum requirement was always supplied, the installed power capacity was not adequate to meet all the demands. Therefore, power rationing had to be instituted for small non-essential industries and private consumers. The electric power consumption of private consumers was held to a minimum and practically restricted to the use of lighting and radio. Electric household appliances were almost non-existent.

foremen who had retired and could not be replaced, the level of skill was constantly becoming inferior when compared to old standards. This was also due to highly specialized courses at the university. These young engineers and technicians were well trained in their narrow fields but it was impossible to convert the operation of the power plants to fit their special skills. They were not respected by the older skilled technicians who had long years of training on the job. The so-called "old guard" refused to train the new engineers because of inequity of pay and also for fear of eventually losing their own jobs to the Communist indoctrinated youths.

Between 1948 and 1956, 46 electrical engineers were graduated from Budapest Technical University and Miskolc University. Twelve of these engineers were sent to the Soviet Union in the fall of 1955 for one year of practical training. When they returned, they were scheduled to replace the power plant directors who were nearing or were over the retirement age.

Everyone shirked their duty and avoided positions of responsibility because the slightest discrepancy or normal breakdown in a plant could cause imprisonment. Also, a skilled worker often earned more money than a foreman or an engineer in a responsible position because premiums were given to workers upon completion of the norm or over production. But it was difficult for men in responsible positions to share in the extra bonuses. In addition, if the schedules or norms were not met, it often meant a reduction in salary or imprisonment. Therefore, there was no incentive for skilled workers to become foremen.

Salary groups were as follows:

Foremen ------------------ 950 to 1,700 forints

Technicians -------------- 1,100 to 1,700 forints

Plant engineers ---------- 1,300 to 1,700 forints

Chief engineers ---------- 1,700 to 2,600 forints

The normal work schedule of the power plants was three eight-hour shifts daily (0600 to 1400, 1400 to 2200, and 2200 to 0600). This schedule was worked out by the Ministry of Mines and Power and the Trades Union Council. The work week of each employee was 56 hours, lunch and coffee breaks included. Overtime pay was prohibited and if overtime was absolutely necessary, compensatory time was given.

5. Planned Development of Hydroelectric Potential

The underdeveloped hydroelectric potential of Hungary was located primarily on the upper Danube River between KOMAROM and ESZTERGOM. This particular part of the river was chosen by a joint Hungarian-Czechoslovak commission because of its comparatively rapid flow there.

The plan of the commission was to build five hydroelectric power plants, each with an installed capacity of 40,000 kw. Construction was to begin during the Second Five-Year Plan (1957-1962). The construction would be financed jointly by Hungary and Czechoslovakia. Canals were to be built in order not to obstruct river navigation.

A hydroelectric potential was also located on the Tisza River. An announcement was made in May 1956 at an electric power conference [redacted], that preliminary plans were underway to construct 13 low capacity hydroelectric power plants on this river between TISZALÖK and SZEGED. The capacity of these power plants would total 110,000 kw. The construction of the 13 plants would serve in conjunction with the ambitious irrigation program of the Lowand. Construction on the upper reaches of the river had been underway for two years in an effort to make the river navigable between POLGAR and the Soviet Union. 25X1

25X1

The construction of a hydroelectric plant (total capacity 150,000 kw) and dam was planned to harness the power of the Rába, Pinka, and Gyöngyös Rivers near the [redacted] border. This plan was announced by Béla ANDOR, chief engineer for hydroelectric power plants at conferences in 1955 and 1956. Although this project was included in the second five-year plan (1957-1962) the plan to construct the 13 power plants on the Tisza River was not included.

6. **Fuels** 25X1

a. Coal and Peat

[redacted] the fuel supply, especially coal reserves, was very limited. [redacted] based this estimate on continuous participation in electric power conferences. The Ministry of Mines and Power was aware of this problem but claimed that in 15 years nuclear powered plants would replace some of the present plants.

The Kazinbarcika (Borsod) Power Plant, supplied by the Borsod coal mines, had an estimated coal reserve of 25 years. The Mátravidék plant, supplied by the nearby Petőfi mines, had an estimated coal reserve of 15 years. The Inota plant, supplied by the Várpalota lignite fields, had an estimated reserve of 15 years. [redacted] could not estimate the fuel reserves available to the other thermal power plants. 25X1

A peat field of great potential, located immediately southeast of Lake Balaton and extending approximately to KESZTHELY, was to be exploited. ERBE (Power Plant Projecting and Building Company) was planning a 60,000 kw plant within this field. An estimated 30 years fuel supply would be available for this plant.

b. Gas

Although the new Tiszapalkonya thermal plant used coal from the Kazincbarcika (Borsod) mines, it would subsequently receive its fuel from the waste material of the Tiszapalkonya Chemical Combine when completed. This combine would receive its gas fuel from Rumania and limited amounts from the Mezőkeresztes oil fields.

The Lovászi and Bázakerettye power plants utilized natural gas from the surrounding oil fields. These fields had an estimated reserve of 25 years. The Lovászi oil fields supplied 30 percent of its production to BUDAPEST.

A new natural gas field of great importance was discovered in 1952 near PUSZTAEDERICS between NAGYKANIZSA and BÁZAKERETTYE. ERBE was planning to construct a power plant and an unknown type factory in this area. The HAJDÚSZOBOSZLÓ power plant (1,500 kw) was supplied with natural gas from nearby gas fields.

[redacted]

7. **Recent Construction**

Until 1952 the production of construction materials, especially concrete and brick, was lagging behind the over-all requirements. At this time a new brick factory was constructed at MÁLYI. This factory supplied the brick and tile for the recently constructed Tiszapalkonya power plant. The new factory proved unable to meet the stepped-up demand for construction materials. Consequently, in the spring of 1953, the Ministry for Construction Materials was dissolved, ostensibly, because of gross negligence in the production of construction material. A new 25X1 Ministry for Construction was established which succeeded in increasing the production of construction material but at the expense of lowering the quality, which again delayed the production schedules. But because of the great importance attached to the construction of the new power plants, the highest priority was given to construction material, labor and technical assistance. Therefore, all possible assistance was given on a priority basis.

In December 1956, [redacted] a conference of Electric Power Plant Directors and Technicians, where the Minister for Mines and Power Plants, Sándor CZOTNER, acquainted those present with the power situation in Hungary. [redacted] all power plant construction plans were to be carried [redacted] out on a schedule despite the losses suffered in the October 1956 revolution. [redacted] 25X1 the construction of the Tiszapalkonya Power Plant. This, [redacted] was to be accomplished with the material assistance of the USSR and, if necessary, at the expense of delaying other industrial constructions to assure the necessary capital. This priority applied to the coal mines also. During the discussion period [redacted] construction plans for two high capacity atomic reactors on Sváb Mountain 25X1 (Svábhegy) in BUDAPEST, to be built under the second five-year plan (1957-1962). They would alleviate to a great extent Hungary's existing power shortage. [redacted] a Soviet expert on atomic energy who addressed the gathering briefly, through an interpreter, and said that he would remain in Hungary and supervise the reactor's construction until completion. The name of the Soviet expert sounded like SHAMANKOV (phonetic spelling).

a. Power Plants Under Construction

Hungary's intensive plans to increase her electric power output was evidenced by a glance at new plants under construction and in planning. The following examples illustrate this:

(1) Thermal Power Plant in HIDAS

During 1956 [redacted] plans for the construction of a new 60,000 kw thermal electric power plant in HIDAS. [redacted] 25X1 the blueprints of the plant in HIDAS was identical in appearance to the thermal electric power plant in PÉCSUJHEGY (see Annex DD). This plant was planned for construction during the second five-year plan, but the plans were dropped for budgetary reasons. The planned power plant in HIDAS was to be operated by the waste material of a planned briquette plant. The briquette plant, which was also to be constructed under the second five-year plan, was to use peat (Tőzeg 800 to 1,400 kcal/kg) and residue (Pakura) of the Lovasz area oil refinery for briquette production.

(2) Thermal Power Plant in PÉCSUJHEGY)

(See Annex DD.)

[redacted]

(3) Hydroelectric Power Plant in VISEGRÁD

(See Annex EE.)

(4) Nuclear Power Plant in BUDAPEST 25X1

The second five-year plan included the development and construction of an atomic reactor on Hárs hill in Budapest. [redacted] at a conference of electric power officials in December 1956 that plans to construct an atomic power plant with an installed capacity of 200,000 kw was under consideration. [redacted] Chief Engineer Ödön KERÉNYI, who was a member of the Atomic Research Board, minimized the program and stated that the plant would be a mere research station. 25X1

(5) Thermal Power Plants at TISZAPALKONYA, KAZINCBARCIKA (Borsod), AJKA, KOMLÓ, and Mátravidék Plant in MÁTRA[1].

(See Section E of this report for details.) 25X1

(6) Thermal Power Plants in GYŐR and SZEGED

Plans for these two power plants (60,000 kw each) were finished in 1950 but lack of funds prevented their construction. [redacted] plans for this construction were discussed by the Power Plant Trust again in 1956. The Ministry was advised to proceed with the construction but it was again rejected because the great expenditures of the Tiszapalkonya and Kazincbarcika (Borsod) power plants depleted the funds.

b. Transmission Lines Under Construction

A high voltage 110 kv transmission line was under construction between TISZAPALKONYA and DEBRECEN. (See Annex A.) This line was scheduled for completion in December 1956, but because plans were modified to extend the line into Rumania the new scheduled completion date was unknown.

Another transmission line of 110 kv was under construction between DEBRECEN, BÉKÉSCSABA, and SZEGED; its scheduled completion date of December 1956 was not met because the Diósgyőr Iron Works was unable to deliver steel high-tension towers, due to Soviet commitments. This problem was discussed at a meeting of Ministry for Mines and Power. A Ministry representative stated that the Soviets had agreed to let Hungary have the necessary steel towers and that a new completion schedule for December 1957 had been established. The completion of this power line would enable the Mátravidéki Power Plant to control the power distribution in Number 1 High Capacity (110 kv Transmission) Grid in case the main power substation (Népliget) in BUDAPEST was put out of commission. [redacted] this power line would complete the national power grid net of Hungary. The planned 13 hydroelectric plants to be erected on the Tisza River were to cooperate within this transmission line. The construction of new 110 kv transmission lines projected but not yet approved by the Council of Ministers were between AJKA and GYŐR; MOSONMAGYARÓVÁR, SOPRON [redacted]; KOMLÓ, NAGYKANIZSA, LOVÁSZI, ZALAEGERSZEG, SZOMBATHELY and SOPRON; TISZAPALKONYA and UNGVÁR (USSR); LŐRINCI, SZOLNOK and SZEGED. 25X1 25X1

c. Power Sub-stations Under Construction

Power sub-stations of importance were under construction at BÉKÉSCSABA and DEBRECEN. The completion of the Debrecen Power Sub-station (in December 1956)

25X1

[redacted]

would enable the 110 kv transmission grid to supply power to the surrounding chemical, medical, ball-bearing and aluminum manufacturing plants. Up to that 25X1 time the surrounding industries had a shortage of electric power. The projected high voltage transmission line into Rumania would also alleviate the existing power shortage in this area, as would the construction of the 13 hydroelectric power plants on the Tisza River. The Békéscsaba power sub-station was also scheduled for completion by December 1956, but the initial constructions had not begun [redacted] in February 1957. ERBE promised fulfillment of the plans as soon as structural instructions were received.

d. Recently Electrified Railways

The Hungarian State Railway was lagging far behind its electrification plans. This was mainly because the Diósgyőr Steel Plant was unable to deliver the steel towers due to a priority commitment to the USSR.

The only existing electrified railroad line was between HEGYESHALOM and BUDAPEST. Also local electrified trains connected BUDAPEST with the suburban towns of GÖDÖLLŐ, TÖRÖKBÁLINT and SZENTENDRE.

A railway electrification project was presently underway from BUDAPEST to MISKOLC. The section of this line from BUDAPEST to HATVAN was completed in the spring of 1956. [redacted] 25X1 Construction between HATVAN and MISKOLC seemed at a standstill because of delivery difficulties mentioned above. Other electrified railways were planned between BUDAPEST and DEBRECEN, and BUDAPEST and KISKUNHALAS.

C. POWER DISTRIBUTION

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1. History

The distribution of electric power in Hungary was accomplished with three primary grids. (A graphic chart of the entire grid network, [redacted] is included on Annex A.) [redacted] Hungary will have complete 25X1 integration of her electric power when the transmission lines and sub-stations, shown on Annex A as "Under Construction", are completed. [redacted] it would 25X1 then be possible to quickly switch all of Hungary's electric power output to a 25X1 specified area.

All of the current in the three primary grids was standardized at three 25X1 phase, 50 cycle. [redacted] some variations of this standardization existed among the very low capacity power plants that operated primarily for an individual factory.

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[redacted] there had been a gradual increase in the electrification of small villages in Hungary since 1938. [redacted] villages up to 2,000 inhabitants were 75 percent electrified. Communities over 2,000 inhabitants were 100 percent electrified. 25X1

The three grid networks mentioned above were organized as follows:

a. Number 1 Grid

This grid transmitted power at 110 kv to all the major heavy industries and important defense plants in Hungary. For example: Diósgyőr Iron Works, the Csepel Industries in BUDAPEST, the Sztálinváros Iron Works and the Győr Wagon

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[redacted]

Works. The headquarters for this grid was located at the Power Plant Trust in BUDAPEST, Iskola Utca 13. This grid consisted of all power plants rated at 30,000 kw and over. The conductors were aluminum with a cross-sectional area of 60 square millimeters mounted on steel towers. All voltage connections were of Delta type.

Number 1 Grid was under direct control of the Power Plant Trust by means of a high frequency automatic carrier system. The other two grids had a planned production schedule and had to submit daily reports. Instructions to these two grids were conveyed by telephone.

b. Number 2 Grid

This grid transmitted power at 60 kv to the electrified railroad lines, military installations, postal facilities, radio stations and other essential installations, but not to private customers. This grid consisted of power plants within the 10,000 to 30,000 kw range; its headquarters was located in the Ujpest (Budapest Municipal Electrical System - PHOEBUS) Power Plant. Number 2 Grid was able to supply and receive power from Number 1 and Number 3 Grids as deemed necessary. The conductors and towers of this grid were of the same material and size as those used by Number 1 Grid.

c. Number 3 Grid

This grid transmitted power at 35 kv to local industries and private consumers. Selected power plants with an installed capacity of less than 10,000 kw were included in this grid. The conductors were copper (35 sq mm) mounted on wooden or concrete poles. The transmission lines of this grid are shown on Annex A in green, but this is not a true picture of its exact location and the extent of this grid.

2. Control Centers [2]

The control and direction of power distribution was accomplished in the Power Plant Trust control room (see Annex D for pinpoint location). After office hours (0900 to 1700) control was taken over by a shift working in the BUDAPEST V, Báthory Utca 12 control room which had an identical control board. In case of an emergency, control was shifted to underground bunkers in the rock (Szikla) in the Gellért Mountains, in BUDAPEST. All information from the plants in Number 1 Grid was reported on the high frequency carrier telecommunication system and recorded in the Power Plant Trust's control rooms where the reports were read and recorded by technicians. [redacted] the type of communications employed was strictly functional, [redacted] no technical information and [redacted] only describe briefly the operational aspects of it, when it was installed and by whom, its origin and an opinion of its efficiency. 25X1 25X1 25X1

[redacted] the communications system was of the carrier type and that the lines of the power system were used to carry the signals. [redacted] the system was installed during the years 1950, 1951 and 1952 by a team of [redacted] technicians, [redacted] 25X1
The equipment was manufactured [redacted] it was originally designed in 1936. [redacted] it was the only complete installation of its type in Europe [redacted]

C-O-N-F-I-D-E-N-T-I-A-L

25X1

C-O-N-F-I-D-E-N-T-I-A-L

[redacted]

25X1

The Hungarian installation was capable of transmitting phone, teletype and signalling information simultaneously. [redacted] the number of channels, the frequency of operation, methods of connecting to the high voltage lines or any technical details.

25X1

The system was operative only on Number 1 Grid of the power system with provisions made at unknown locations for switching into the systems of Number 2 and Number 3 Grids, which used telephone facilities for communications. [redacted] 25X1 [redacted] no further information on this arrangement.

[redacted] there was a considerable amount of technical signal equipment installed in each of the 12 power stations of Number 1 Grid and at the sub-stations in GYŐR and SZEGED. On the control panel of each station, there was an ordinary telephone and a teletype set. In addition to these items there were a great number of signal lights on the control panel, which were controlled by the carrier system. These signal lights were also represented on the master distribution panel in the Power Plant Trust's Control Room. They indicated any sort of malfunction anywhere in the system. 25X1

[redacted] the communication system worked perfectly and [redacted] never known it to be out of order. Repair and maintenance was performed by a team of repairmen who were stationed in BUDAPEST. These personnel visited the various stations once a month and performed normal preventive maintenance on the system. In addition, the [redacted] firm which installed the equipment visited the installation once each year and gave it a very thorough checking. 25X1 25X1

3. Interruption Factors

[redacted] if the four most important sub-stations (Mátravidék in MÁTRA, GYŐR, Népliget in BUDAPEST, and DIÓSGYŐR) in the Number 1 Grid were destroyed, the result would be a complete paralysis of Hungary's heavy and light industries. Only the local and small capacity power plants would be able to continue operation. The destruction of the main power sub-station in NÉPLIGET would cripple BUDAPEST's electric supply and would cut off electricity to the surrounding heavy industries; the result would be a shortage of 200,000 kw of power. Although the Mátravidék sub-station could take over control and still supply 400,000 kw of power to the high capacity national grid, the high frequency automatic control would also be disrupted and the Mátravidék control station would have to rely upon telephone communication. Destruction of the Mátravidék power sub-station would mean a shortage of 400,000 kw electric power to Number 1 high capacity Grid and the subsequent destruction of either of the other three important sub-stations in Hungary would result in serious curtailment of power in the national grid. The destruction of a power plant would result only in the shortage of the respective power plant's output. The cutting of one transmission line would have no serious results because the power sub-stations could switch the electric power to other lines or through other regional nets. [redacted] the elimination of the four above mentioned major power sub-stations would completely paralyze Hungary's power supply. In the foreseeable future the power sub-station to be constructed in DEBRECEN would also play an important role in the power distribution for it was to receive electric power from Rumania. 25X1 25X1

4. Air Defense Transmission Lines

In most of the major industrial plants in Hungary, a so-called Air Defense Line could be found. The general consensus among the electrical technicians was that this was a reserve standby line in case of emergency. All the air defense lines were classified SECRET; they were underground

C-O-N-F-I-D-E-N-T-I-A-L

[redacted] 25X1

cables and did not appear on power net maps; they transmitted at 35 kv. Under no circumstances could the transmission of power on these lines be interrupted. 25X1 [redacted] for example, that the Diósd radio transmitter was supplied from the Székesfehérvár Power Plant's sub-station by a direct air defense line, while the Eger Fine Appliance Factory was served by an air defense line from the Diósgyőr Power Plant. The Ikervár Hydroelectric Plant sub-station had a parallel defense line to a radio relay station which [redacted] was also a jamming station. It was located between IKERVÁR and SZOMBATHELY. The Air Defense Lines assured electric power to the most important air defense centers, postal services, radio services, and military centers. However, after the Communist regime came to power, these lines were used to transmit power to strategic industrial installations. Formerly, they were reserved solely as emergency lines in case of air raids or when the overhead lines were destroyed. 25X1

5. Power Sub-stations (See Annex A.)

The Népliget Power Sub-station, the largest and most important in BUDAPEST, had the output of 12 power plants routed through it. It was located in the People's Park; it occupied an area of about 600 x 300 m which contained two one-story brick buildings housing distributor relays. (See Annexes E and F.) There were 10 transformers in the transformer yard, each was provided with a 600 liter oil capacity circuit breaker. Eight incoming high tension cables connected this sub-station with the other sub-stations. This sub-station was the heart of the control and distribution of power for all high capacity power plants. During the 1956 revolution, the existing power supply provided by the Mátravidék Power Plant and the Komárom sub-station was controlled and distributed from this station. Security guards were provided by the AVH (Hungarian Security Forces) who checked the station periodically.

The Diósgyőr Sub-station was one of the four important sub-stations within the Number 1 high capacity Grid (see Annex G and H).

The Győr Sub-station was located inside the Győr Power Plant. It was similar in shape and construction details to the power sub-stations in BUDAPEST (Népliget) and DIÓSGYŐR. It was connected with the power plants in AJKA, KOMLÓ, SOPRON, VÁRPALOTA, SZÉKESFEHÉRVÁR, SZOMBATHELY, KŐSZEG, and IKERVÁR, as well as the main power sub-station in BUDAPEST (Népliget).

The Mátravidéki Sub-station was located inside the thermal power plant. 25X1
[redacted] no further information.

D. ELECTRIC POWER PRODUCING EQUIPMENT

1. Equipment Procurement

Until 1954 Hungary had been dependent upon imports to supply her with electric power producing equipment. However, since 1954 the Hungarian industry had advanced to such a degree that it was capable of planning, constructing, and equipping two thermal power plants in China and [redacted] in USSR [redacted] 25X1
[redacted] In addition, ERBE drew the plans for a thermal power plant in Yugoslavia. 25X1
[redacted]
the Hungarian power plants were cheaper and superior to those of foreign enterprises competing for these jobs. 25X1

Hungary was supposedly exporting transformers to many countries; also, pulverized coal injection fed boilers, electric motors, and diesel engines.

[redacted]

Although Hungary had made amazing progress in these major items of equipment, she was still completely dependent upon imports for precise measuring instruments such as volt-amp-watt meters, automatic voltage regulators, calorimeters, and special control motors of the Leonard type. These instruments were imported chiefly from [redacted] East Germany. Equipment of Western manufacture was generally available [redacted] The high frequency telecommunications equipment, mentioned before, was installed [redacted] All power plants in Hungary were [redacted] equipped with some imported equipment but no detailed figures were available [redacted]

Many of the major items of equipment produced by Hungary were copied from foreign equipment. [redacted] facturers attempted to make slight modifications on all copied models. [redacted] Hungarian plants were gradually attaining top efficiency in their production of power producing equipment and spare parts. In describing the various equipment used in the Hungarian Thermal Power Plants, [redacted] drawings found in a textbook written by Zoltan GATI, Professor at the Technical University in PECS, were the exact representations of the equipment manufactured and installed as listed below. These textbook drawings are shown as Annexes I through P.

2. [redacted] Type of Equipment

a. Boilers and Steam Storage Tank

Four typical boilers now in use in Hungarian power plants are listed below:

(1) Ship Boilers (See Annex I)

This [redacted] boiler was produced at the Ganz Ship Plant (Ganz Hajogyar) located on Vaci Road, BUDAPEST 13. These ship boilers were in sizes from 5 to 100 tph in 5 tph increments. [redacted] several of these boilers (30 tph) were installed at the power plants in KAZINCBARCIKA (Kisbarcika), VARPALOTA and SZEKESFEHERVAR.

(2) Babcock-Wilcox Boilers or Angle Grate Boiler (See Annex J.)

This type of boiler was used in older, usually smaller capacity, power plants, such as those in SALGOTARJAN, KECSKEMET, and SZEGED. This boiler was manufactured at the same plant and in identical sizes as the above ship boiler.

(3) Cornwall Axle Type Boiler (See Annex K.)

These were low capacity boilers (5 to 10 tph) used in small plants. [redacted] the plant in KISKUNFELEGYHAZA used these boilers. They were also manufactured at the Ganz Ship Plant.

(4) Stirling Boiler (See Annex L)

This was the most modern boiler employed in Hungary. It was installed in the recently constructed plants at TISZAPALKONYA, KAZINCBARCIKA (Borsod), and MATRA. This boiler (30 to 100 tph) was equipped with traveling grate system (see Annex N) and pulverized coal injection device. The original Stirling design had to be modified for Hungarian use by moving the firing place nearer to the boiler for the low calorie coal. This type boiler was manufactured at the Ganz Ship Plant in BUDAPEST.

(5) Ruths Steam Storage Tank (See Annex M)

Ruths type steam storage tanks (by Ganz) were installed in power plants of number 1 Grid. The tanks stored enough steam for two hours of turbine operation.

[redacted] 25X1

b. Turbines

The major types of turbines in use in Hungary were the obsolete "Zoelly" turbine (see Annex O) and the newer Brown-Boveri Company (BBC) turbine (see Annex P). [redacted] the old Zoelly turbines were uneconomical and were being replaced by the BBC turbine. All new plants were being equipped with the BBC turbine. Both of these turbines and parts were manufactured, with slight Hungarian modifications, by the Lang Machine Plant (Lang Gépgyár), Váci Utca, BUDAPEST 13. 25X1

c. Transformers

Transformers presently in use in Hungary were designed by a former Hungarian firm, Szabó-Mátéffy Transformer and Electric Appliance Plant, Kőbányai Ut, , BUDAPEST. This plant was nationalized in 1950 and taken over by the Ganz Electric Plant (Ganz Villamossági Gyár), Lövőház Utca, BUDAPEST 2. In addition to transformers, this plant manufactured electric motors and motor-generator units.

d. Cranes

Cranes of approximately 25 to 50 ton capacity used in the power plants were produced at the Crane Plant in GYŐR.

e. Miscellaneous Equipment and Plants

Ganz Control Equipment Plant (Ganz Vezérlő-Gyár), Kőbányai Ut, BUDAPEST 8. This plant manufactured control equipment, switch gear equipment and various types of fuses.

The Ganz Motor and Machine Plant (Ganz Motors Gépgyár), Köbányai Ut, BUDAPEST 8. This plant manufactured diesel motors, speed regulators, and turbines.

United Incandescent (Egyesült Izzó), Külső Váci Ut, BUDAPEST 4, manufactured mercury rectifiers and electric pumps.

The Furnace and Chimney Construction Enterprise (Kazán és Kémény Berendezési Vállalat), Fehérvári Ut, BUDAPEST 9, constructed smoke stacks and installed furnaces and caloric steam pipe installations.

The Pump Manufacturing Plant (Szivattyú-Gyár) manufactured high pressure pumps.

The Electric Measuring Instruments Factory (Elektromos Merő Müszerek Gyára), Külső Kerepesi Ut, BUDAPEST 10, manufactured volt-amp meters, and transformers.

The Diósgyőr Steel Construction Plant (Diósgyőr Vasszerkezeti Gyár) manufactured steel frames, rods, steel structures for control houses, and steel towers for high voltage transmission lines.

The Budapest Cable Plant (Kábel Gyár), Fehérvári Ut, BUDAPEST 9, manufactured transmission cables and wires, insulators, tar paper, bakelite strips, and insulator oils.

The Kőbányai Ceramic Plant (Kőbányai Kerámia Gyár, formerly Drasche Művek) manufactured fire brick (chamot) for furnaces and pipes, fire-proof "Steatit" porcelain, and high voltage porcelain chain insulators.

[redacted]

The Csepel Pipe Manufacturing Plant (Csepeli Cső Gyár) in BUDAPEST manufactured pipes for boilers.

The Ózd Steel Plant (Ózdi Vasgyár) manufactured rolled iron sheets for the boilers.

f. Installation of Power Plant Equipment

Items of equipment used in connection with water were installed by the installation department of ERBE, located at Martirok Utja, BUDAPEST 2.

E. POWER PLANTS

1. Organization and Operation

The power plants in Hungary were controlled by cooperatives Number 1, 2 and 3 (see Annex B). These cooperatives constituted the three major transmission grids in Hungary. The following organization and operation was common to all power plants.

a. Planning Department

Each electric power plant had a planning department which was staffed by a chief planner and one or more technicians (depending on the size of the plant) who were chiefly concerned with submitting budgetary yearly plans to the Electric Power Plant Trust for approval. The budget had to be submitted during the summer preceding the calendar year that the plan was to go into effect. The plan consisted of three sections: production; inspection, repair, and service; and development and improvement of plant. Before the planning department began to assemble the final plan, all departments submitted their routine inspection, repair, innovations and maintenance needs for the following year. The plans of the departments had to be reviewed and signed by the power plant manager. He eliminated duplication from the plans and also correlated the amount of expenses for repair, service, and maintenance to the value of equipment (which was not to exceed 15 to 20 percent of value). [redacted] the plant manager's chief difficulty was lack of money, workers, and materials (50 percent of the needed spare or component parts were available). [redacted] plant managers had to juggle allocations carefully just to receive a portion of money requested. [redacted] when the money was received the plant manager's task was to divide the appropriation in such a way that his plant would continue operating according to the Ministry's orders. He never paid attention to the amount the Ministry allotted for each item, but left it to his bookkeeper to "cover up" by juggling the figures to show the prescribed inspection repairs for the book auditor from the Ministry. [redacted] the planned production had to be fulfilled, no matter how much the inspection, repair and service or development and improvement suffered because of the 100 percent production figure. This was always equal to full capacity of each plant. The pay of the plant manager and his staff (chief engineers) was contingent on production (80 percent production meant 80 percent pay for the plant manager and his staff). Full production was automatically rewarded by premium; loss in production caused immediate investigation by inspectors of the Ministry and the AVH; the scapegoats were punished. After a planning department had received the plan from the plant manager, they submitted it for approval to the Electric Power Plant Trust. Prior to 31 December, preceding the year the plan was to be effective, the Electric Power Plant Trust returned its version of the plan with changes and/or approval. [redacted] the Electric Power Plant Trust never saw "eye to eye" with reality and stressed production

25X1 25X1 25X1 25X1 25X1

25X1

above the other two sections, and appropriated only a portion of the requested amount for repairs and improvements. No matter how valid the arguments of the plants, the Electric Power Plant Trust always won. [redacted] made up most of the appropriation shortage by not changing oil in transformers and turbogenerators as prescribed, but [redacted] instructed responsible personnel to watch that the transformer temperature should not exceed 90 degrees Centigrade (permitted temperature 110 degrees Centigrade) and to watch the turbogenerators. Furthermore, [redacted] built calorimeters in the boiler system to save coal. 25X1 25X1 25X1

(1) Allocation of Appropriation to Departments

When the plans for the year were returned by the Electric Power Plant Trust, they were divided into quarters, then into monthly and finally into weekly plans. The weekly plans were then submitted to the individual departments where they were divided into daily plans and the requirements were entered in the work log (Üzemnapló). Each piece of equipment and/or auxiliary equipment had its individual work log which contained the equipment nomenclature, its necessary service schedule and a space for breakdowns and repairs. The work log had to be signed during each shift by every department chief who also added, if applicable, a note of observation if a fault were discovered in the preceding shift; to clear himself in case of any breakdown in the equipment. Every 24 hours the plant manager or his assistant reviewed the work logs and signed them.

Supplementary budgetary plans were issued during the budget year, usually when an unexpected machine breakdown occurred. For example: one turbogenerator breakdown required one week to repair. The supervisor of the respective turbogenerator department immediately reported the breakdown over the carrier communications system to the Turbine Department in the Electric Power Plant Trust3.

The supervisor of the turbogenerator drew up plans of expected expenses, which included material and labor, and submitted them to the plant manager who in turn submitted the supplementary plan to the Electric Power Plant Trust for approval. In case the amount needed for the repair of the turbogenerator exceeded the already approved appropriation for the fiscal year, a supplementary appropriation was approved. [redacted] in case a money-saving improvement was installed in a power plant, the supervisor of the department submitted a plan showing the saving, in which case the Electric Power Plant Trust had to be reimbursed. 25X1

b. Inspection, Repair, and Service

[redacted] inspection, repair and service in the power plants were so complex that it was impossible [redacted] to recall all the details. [redacted] 40 pumps were needed in one of the plants, which included pumps for untreated water, condenser-air, circulation pumps for turbogenerator feed and steam, injection pumps to boilers and others. Shortages such as these were the reason why all inspectors, no matter how skilled, shied away from investigating the correct use of appropriations, when the plant was running smoothly. 25X1

[redacted] routine tests and maintenance were continuously performed by the men in charge of the individual equipment, who continuously had to observe the instruments of the machines in operation and to report immediately in the work log any deviation from normal operation. [redacted] every plant manager was most concerned about boilers. The boilers were the most sensitive equipment and each required monthly service. 25X1 25X1

[redacted]

25X1

The permitted period for servicing each boiler was eight weeks for a 42-man service crew. [redacted] repair crew consisted of the machine shop crew and special boiler crew geared for the highest efficiency and could service a boiler in four weeks. The saving in money, which was kept secret, was divided among the boiler service crew and the plant management. [redacted] the reason [redacted] kept the time and money saving secret, was because previously a few persons who had invented time-saving procedures received only a small token award, while the saving actually amounted to many thousands of forints. 25X1 25X1 25X1

Most of the time was saved by the plant chemical engineer who used an unidentified formula [redacted] which dissolved boiler water residue. This solution was sprayed on the lining of the boiler after which simple scrubbing and flushing removed the residue. Previously, the removal of this residue was the most time-consuming work in the entire servicing program. Subsequently the innovation was incorporated in routine servicing. 25X1

[redacted] before the crew began servicing a boiler they carefully studied the deficiency entries in the boiler log, then the boiler was completely disassembled and all defective parts were replaced. After reassembling the boiler a 24-hour water pressure test was conducted, which was witnessed for a few hours by the plant manager and his staff. A report of each boiler service was then made, signed by the plant manager and forwarded to the Electric Power Plant Trust. While one boiler was being serviced, the boiler to be serviced next was closely watched for deficiencies. 25X1

25X1

[redacted] the remainder of the equipment, including the turbogenerators, which were supposed to be serviced every two years, were ignored, but entered in the log as "service accomplished" and the money allotted for their service was drawn from the bank. [redacted] this money was then used to carry out necessary repairs for which a budget was originally submitted to the Electric Power Plant Trust and disapproved. [redacted] the service time allotted for a turbogenerator was four weeks. [redacted] usually the double holidays (1 and 2 May and 2 Christmas days, etc.) were used to perform the most needed repairs on the turbogenerators and actually a turbogenerator was serviced only once every three years. 25X1 25X1

25X1

[redacted] all budget expenditures for operation and maintenance were planned in advance and always closed with a deficit. Maintenance was neglected because of a shortage of funds. For example, the construction budget of 180,000,000 Forints for the Mátravidék Power Plant ran into 240,000,000 Forints by the time remodeling was completed. Funds usually projected for the up-keep and maintenance of the plants were directed into other channels because of necessity.

There was no shortage of skilled labor at the lower echelons such as line repairmen, mechanics and locksmiths. There was, however, a shortage in the more responsible and executive positions. Turbine breakdowns, and frequent accidents on the job could be traced to the lack of maintenance. [redacted] the chief reason for these breakdowns and accidents was the lack of maintenance funds and the reluctance on the part of some engineers to accept positions of responsibility for fear of severe reprisals against them in case of a major breakdown or accident. 25X1

It was practically impossible under a given budget to fulfill the production norms unless one circumvented the prescribed rules and regulations of operations. Therefore, skilled engineers desired positions of skilled technicians rather than a job of responsibility. [redacted] For example: a former engineer of the Ganz Electric Plant with approximately 30 years 25X1

25X1

experience as chief engineer for the construction department was working as a switchboard operator at the Csepel Paper Factory in 1957. This man, Károly POZVEK, had refused a position with the Electric Power Plant Trust. [redacted] breakdowns and accidents would increase due to this lack of supervised maintenance. 25X1

25X1

c. Miscellaneous Operations

(1) Laboratory Functions

Every plant had a laboratory usually staffed with a chemical engineer or technician, who was to take an hourly test of the feed-water coming in after the treating process. [redacted] water had to be below 18 degrees "Hard" (German water measurement, sic) before it could be used in the boilers. Slag was tested for coal content by heating it 360 degrees Centigrade. The maximum coal content allowed before slag could be discharged from a furnace was below five percent. Results of these tests were entered into the plant's log. A sample of the plant's coal had to be sent monthly to a technical university for testing. 25X1

(2) Communication Equipment (Other Than Carrier Communication System)

Each electric power plant in Hungary had a telephone switchboard which operated over the Hungarian Postal System (PTT). All used "Citromat" type switchboards. The large power plants, including the Mátra plant had a switchboard with 5 outside trunks and 200 extensions. The smaller power plants of 60,000 and 80,000 kw capacity, including Komló, Ajka, Tatabánya, Bánhida, Dorog, and Salgótarján had a "Citromat" with 2 outside trunks and 50 to 80 extensions.

(3) Operation of Boilers

Most of Number 1 Grid's thermal electric power plants had six boilers, which were controlled from a control table and could be instantly switched. Of the six boilers, one was kept in ready reserve, one was being serviced, and four were in operation. 25X1

(4) Transformers and Transformer Yards

25X1

[redacted] most of the transformer yards described in this report contained either 15,000, 20,000, or 30,000 kw transformers. [redacted] 15,000 kw transformers contained 400 liters of oil, the 20,000 kw transformers contained 600 liters of oil, and the 30,000 kw transformers contained 800 liters of oil. Oil was supposed to be changed every year and also when the temperature of the transformer went above 110 degrees Centigrade. Oil was automatically fed to the transformers. The transformers were controlled from the control table. White lights on the control table showed which transformers were in operation and could be switched instantly. 25X1

(5) POL Products Used and Stored in Power Plants

Each plant maintained a six-month reserve of POL products, consisting of various types of oil (transformer, turbogenerator) grease, gasoline, and kerosene. The POL products were stored in underground tanks located below the open transformer yard. Source was unable to elaborate on the size and capacity of the POL tanks.

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2. High Capacity Power Plants (See Annexes S through GG)

All power plants with an installed capacity of over 30,000 kw belonged to the Number 1 High Capacity Cooperative and formed Number 1 Grid, which transmitted at 110 kv. The red circles and red squares on Annex A show the locations of high capacity power plants; the alignment of Number 1 Grid is shown as red lines. The power plants listed below were part of the above mentioned cooperative. Numbers shown in parenthesis correspond to those shown next to the red circles and red squares on Annex A; these numbers are also the official Hungarian designation for these plants.

Annex	High Capacity Plants	Official Hungarian Numerical Designation	Installation Capacity in Kilowatts	Rate of Production in kw/hr 4.	Fuel
S	Tiszapalkonya Thermal	(1)	240,000		Chemical waste
T	Borsod Thermal	(2)	180,000	200,000	Coal
U	Mátra Thermal	(3)	135,000	140,000	Lignite
V	Kelenföld Thermal	(4)	95,000	100,000	Coal
W	Ájka Thermal	(5)	80,000	80,000	Coal
X	Komló Thermal	(6)	80,000	80,000	Coal
Y	Inota Thermal	(7)	80,000	80,000	Peat and coal
Z	Bánhida Thermal	(8)	60,000	60,000	Coal
AA	Doreg Thermal	(9)	60,000	60,000	Coal
BB	Tatabánya Thermal	(10)	60,000	60,000	Coal
CC	Salgótarján Thermal	(11)	60,000	60,000	Coal
DD	Pécsujhegy Thermal	(12)	60,000	60,000	Coal and waste
EE	Visegrád Hydro a/c Electric	(13)	20,000	-------	Hydro Electric
FF	Csepel Thermal	(14)	60,000	60,000	Coal
GG	Sztálinváros Thermal	(15)	60,000	60,000	Coal

3. Medium Capacity Power Plants

All power plants with output between 10,000 and 30,000 kw belonged to the Number 2 Medium Capacity Cooperative and formed Number 2 Grid which transmitted at 60 kv. The blue circles on Annex A show the locations of medium capacity power plants; the alignment of Number 2 Grid is shown as blue lines. The power plants listed below were part of the above mentioned cooperative. The numbers shown below in parenthesis correspond to the numbers shown next to the blue circles on Annex A; these numbers are also the official Hungarian designation for these plants.

[redacted]

a. Thermal Power Plant in GYOR (3) 25X1

This thermal power plant was constructed after World War I (possibly 1925) by the city of GYOR. [redacted] it was hopelessly obsolete and inefficient. There were proposed plans to dismantle the plant completely and construct a new 60,000 kw thermal power plant on the same site. The plant had an installed capacity of 14,000 kw and a production rate of 14,000 kw/hr throughout the year. Four Zoelly condenser type turbogenerators and six Babcock and Wilcox (5 tph and 35 atm) traveling grate type boilers were being utilized. Coal rated at 3,000 to 3,500 Kcal/kg was used for boiler operation. [redacted] the amount of coal needed for the plant's operation, [redacted] there was always one week's supply stored in the plant area. The open transformer yard of the plant was constructed in 1948. It was one of the four most important transformer yards in Hungary; it contained six transformers, three of which were of 10,000 kw cpacity and the others were of 30,000 kw capacity. 25X1 25X1

The transformer yard was installed at this plant upon its nationalization. (See Annex Q for plant layout and Annex R for pinpoint location.)

b. Thermal Power Plant in SZEGED (14)

The capacity of this plant was 14,000 kw. However, the output of four other power plants of Number 3 Grid was transmitted to the transformer yard here. These four power plants were located in KECSKEMÉT, KISKUNFÉLEGYHÁZA, BÉKÉSCSABA and OROSHÁZA. Power at a rate of 28,000 kw/hr was produced by the combined plants. The open transformer yard of the Szeged plant was constructed in 1950 and was one of the four most important sub-stations in Hungary. It had four, closed, oil cooled transformers (two 30,000 kv and two 15,000 kv) with a voltage ratio of 35 kv/110 kv. It was planned to enlarge the Szeged Power Plant to a 60,000 kw capacity during the second five-year plan (1957 to 1962). (See Annex HH for pinpoint location and Annex II for site layout.)

c. Ujpest PHOEBUS Thermal Power Plant in BUDAPEST (1)

This power plant was old, though still in good condition. It supplied power to BUDAPEST's electrified Public Transportation Service through 60 kv transmission lines. The capacity of this plant was 30,000 kw while the average production rate was 28,000 kw/hr; it was also utilized as a peak power plant. The directorate of the Medium Capacity Plants had its headquarters in this plant. The director was György SZARKA. The plant's equipment consisted of five boilers and three turbogenerators. Coal was supplied by the Coal Distribution Trust.

d. Thermal Power Plant in BUDAPEST (2)

This plant supplied a small percentage of its output to small industries in BUDAPEST. The capacity of this plant was 30,000 kw and the average production rate was 20,000 kw/hr. The plant's equipment consisted of five boilers and four turbogenerators. Coal was supplied by the Coal Distribution Trust.

e. Thermal Power Number 2 in GYOR (4)

This plant's capacity was 14,000 kw and the average production rate was 14,000 kw/hr, all of which went to the Győr Railroad Machine Plant (Wagon Gyár).

f. Thermal Power Plant in VÁRPALOTA (5)

This plant supplied power to the Várpalota Coal Mines. Its capacity was 15,000 kw and the production rate was 15,000 kw/hr. The plant's equipment consisted of two boilers, one turbogenerator and one steam engine. Coal mixed with lignite rated at 3,000 kcal/kg was supplied by various mines.

g. Thermal Power Plant in SZÉKESFEHÉRVÁR (6)

The capacity of the plant was 12,000 kw and the average productive rate was 10,000 kw/hr. The plant's equipment consisted of four boilers and three turbogenerators. Coal and lignite rated at 3,000 kcal/kg were supplied from various mines.

h. Thermal Power Plant in PÉCS (7)

The capacity of this plant was 22,000 kw; its average production rate was 20,000 kw/hr. The plant's equipment consisted of five boilers and four turbogenerators. Coal rated at 4,000 kcal/kg was supplied by the Pécs mines.

i. Thermal Power Plant in BUDAPEST (Kispest)(8)

This plant's capacity was 14,000 kw; its production rate was 12,000 kw/hr. The plant's equipment consisted of four boilers and three turbogenerators. This plant was modernized in 1951 and the old equipment was shipped to ADDIS ABABA, Ethiopia. The plant's coal was supplied by the Coal Distribution Trust.

j. Thermal Power Plant in EGERCSEHI (9)

This plant formerly supplied only the Egercsehi coal mines. Capacity of the plant was 14,000 kw; average production rate was 12,000 kw/hr. A power line was to be constructed from this plant to recently discovered uranium mines 10 km from EGERCSEHI; Source did not know in which direction. The plant's equipment consisted of four boilers and three turbogenerators. Coal was supplied by the Egercsehi coal mines.

k. Thermal Power Plant in KURITYÁN (10)

This plant formerly belonged to the Kurityán coal mines. The plant's capacity was 14,000 kw; average production rate was 12,000 kw/hr. The plant's equipment consisted of three boilers and two turbogenerators. Coal was supplied by the Kurityán coal mines.

l. Thermal Power Plant in NYIREGYHÁZA (11)

The capacity of this plant was 14,000 kw; its average production rate was 12,000 kw/hr. The plant's equipment consisted of four boilers and three turbogenerators. Coal was supplied by the Coal Distribution Trust.

m. Thermal Power Plant in DEBRECEN (12)

This plant's capacity was 20,000 kw; its average production rate 16,000 kw/hr. The plant's equipment consisted of six boilers and four turbogenerators. The coal was supplied by the Coal Distribution Trust.

n. Thermal Power Plant in BÉKÉSCSABA (13)

The capacity of this plant was 14,000 kw; its average production rate was 9,000 kw/hr. The plant's equipment consisted of five boilers and two steam engines. Coal was supplied by the Coal Distribution Trust. (A power sub-station had been under construction since 1954, and was scheduled to be completed in the first five-year plan by the end of 1957; it was to be added to the 110 kv transmission grid.)

o. Thermal Plant Number 1 in DIÓSGYÖR (15)

This plant's capacity was 14,000 kw; its average production rate was 12,000 kw/hr. This plant received power at a rate of 8,000 kw/hr from a low capacity power plant in KAZINCBARCIKA (Kisbarcika) by a 35 kv transmission line. Therefore it had 35/60 kv transformers.[5] Coal was supplied by the Coal Distribution Trust.

p. Thermal Power Plant Number 2 in DIÓSGYÖR (16)

This plant's capacity was 14,000 kw; its production was unknown. This was a waste gas operated power plant. It supplied all its power directly to the Diósgyőr Steel Plant.

4. Low Capacity Power Plants

All power plants between 500 and 10,000 kw belonged to Number 3 Cooperative of the Low Capacity Power Plants. These plants formed Number 3 Low Capacity Power Grid which transmitted power at 35 kv. The Division Chief and Chief Engineer was Zsigmond KISS, [redacted] He was replaced after the October 1956 revolution by KARDOS, (fnu) [redacted] Number 3 Grid is shown on Annex A as a green line. Obviously this grid is only partially represented [redacted] therefore it is shown schematically. The power plants listed below were subordinate to and a part of Number 3 Low Capacity Power Grid. Numbers in parentheses correspond to the numbers on Annex A shown next to green squares or green circles.

a. Kisbarcika Thermal Power Plant (1) in KAZINCBARCIKA

This plant formerly supplied power to the Borsod Coal Mines. The capacity of this plant was 8,000 kw; its average production rate was 7,000 kw/hr. Among the plant's equipment were three boilers and three turbogenerators. Coal was supplied by the Coal Distribution Trust.

b. Hydroelectric Power Plant in GIBÁRT (2)

The capacity of this plant was 600 kw; its average production rate was 600 kw/hr. This plant's power was transmitted direct on a 35 kv line to the Diósgyőr Power Sub-station. Water was supplied by the Hernád River.

c. Hydroelectric Power Plant in TISZALÖK (3)

The capacity of this plant was 8,000 kw; its average production rate was 8,000 kw/hr. This plant's output was transmitted on a 35 kv twin underground cable to the Diósgyőr Power Sub-station. This cable was an air defense line,

classified SECRET and not shown on the power maps of Hungary. When this plant was completed in 1953, old personnel were transferred out and replaced by loyal Communist Party members. The plant was completely automatic and therefore required a minimum number of personnel, consisting in one shift of two electricians, one turbine machinist, and one guard. Water was supplied by the Tisza River.

d. Thermal Power Plant in HAJDÚSZOBOSZLÓ (4)

The capacity of this plant was 1,000 kw; its average production rate was 1,000 kw/hr. Among the plant's equipment were two gas generators, each 500 hp, manufactured on special order by the Ganz Motor and Machine Plant, BUDAPEST. It was fueled by natural gas supplied by nearby natural gas fields.

e. Thermal Power Plant in OROSHÁZA (5)

This plant's capacity was 3,000 kw; its average production rate was 2,000 kw/hr. Among the plant's equipment were two boilers, one turbogenerator and one steam engine. Coal was supplied by the Coal Distribution Trust.

f. Thermal Power Plant in KISKUNFÉLEGYHÁZA (6)

This plant's capacity was 1,000 kw; its average production rate was 500 kw/hr. Among the plant's equipment were two boilers and one turbogenerator.

g. Thermal Power Plant in KECSKEMÉT (7)

This plant's capacity was 8,000 kw; its average production rate was 8,000 kw/hr. Among the plant's equipment were four boilers and three turbogenerators. Coal was supplied by the Coal Distribution Trust.

h. Diesel Power Plant in KISHUNHALAS (8)

This plant's capacity was 4,500 kw; its average production rate was 500 kw/hr (operated only during evening hours). Among the plant's equipment were five diesel engines.

i. Thermal Power Plant in SZŐNY (9)

This plant supplied a nearby chemical plant and oil refinery with electricity. The capacity of this plant was 4,000 kw; its average production rate was 2,000 kw/hr. Among the plant's equipment were two boilers and two turbogenerators. Coal was supplied by the Coal Distribution Trust.

j. Thermal Power Plant in PÉTFÜRDŐ (10)

This plant supplied power directly to a nearby Nitrogen Plant and the Peremarton Ammunition Plant. The capacity of this plant was 4,000 kw; its average production rate was 2,000 kw/hr. Among the plant's equipment were two boilers and two turbogenerators. Coal was supplied by the Coal Distribution Trust.

k. Hydroelectric Power Plant in TASS (11)

This plant's capacity was 1,500 kw; its production rate was also 1,500 kw/hr. Its output was transmitted by underground cable to the main power sub-station in Népliget, BUDAPEST. Among the plant's equipment were three water turbines. The water was supplied by a branch of the Danube River.

l. Thermal Power Plant in SOPRON (12)

This plant's capacity was 4,000 kw; its average production rate was 1,500 kw/hr. The plant's equipment consisted of three boilers and two turbo-generators. Coal rated at 4,000 kcal/kg was supplied by the nearby Brennbergbanya Coal Mines.

m. Brennbergbanya (Mine) Thermal Power Plant (13) in BRENNBERGBANYA

This plant supplied power to the Brennbergbanya Coal Mines. The capacity of this plant was 3,000 kw; its average production rate was 1,500 kw/hr. Coal rated at 4,000 kcal/kg was supplied by the Brennbergbanya Coal Mines.

n. Diesel Power Plant at KÖSZEG (14)

This plant's capacity was 600 kw; its average production rate was 200 kw/hr. Among the plant's equipment were two diesel engines.

o. Diesel Power Plant in SZOMBATHELY (15)

This was a peak power plant operating during the evening hours only. This plant's capacity was 1,500 kw; its average production rate was 500 kw/hr. Among the plant's equipment were three diesel engines.

p. Hydroelectric Power Plant in IKERVÁR (16)

This plant's capacity was 2,000 kw. An output of 1,200 kw/hr was fed into the 35 kv transmission grid; 800 kw/hr was transmitted by cable to a relay station located on the IKERVÁR-SZOMBATHELY road, seven kilometers from SZOMBATHELY. The plant's equipment consisted of four water turbines. The water was supplied by the Rába River.

q. Diesel Power Plant in ZALAEGERSZEG (17)

This plant's capacity was 1,500 kw; its average production rate was 500 kw/hr. Among the plant's equipment were two diesel engines, each 500 hp.

r. Thermal Power Plant in LOVÁSZI (18)

This plant supplied electricity to the surrounding oil fields. It had a capacity of 4,000 kw; its average production rate was also 4,000 kw/hr.

s. Thermal Power Plant in BÁZAKERETTYE (19)

This plant's capacity was 1,500 kw; its average production rate was 1,000 kw/hr.

t. Diesel Power Plant in NAGYKANIZSA (20)

This plant's capacity was 1,500 kw; its average production rate was 500 kw/hr. Among the plant's equipment were three diesel engines, each 500 hp.

25X1

[redacted]

C-O-N-F-I-D-E-N-T-I-A-L

25X1

COMMENTS:

1. [redacted] refers throughout this report to the Mátravidéki Power Plant as being in MÁTRA. However, MÁTRA is not shown as a location place name on locally available maps or gazetters; it is shown as a mountainous area and is located near LORINCI (N47-42, E19-40.)

2. [redacted] 25X1

3. [redacted] each of the seven departments of each power plant was responsible to one department of the same type in the Electric Power Plant Trust, with which they communicated, in any case, at least once daily about the progress in the individual department. The department in the Electric Power Plant Trust issued in turn an over-all monthly progress report to the Ministry of Power and Mines.

4. [redacted] the annual output of the various plants, [redacted] referred to the output as an "average rate of production" or kw/hr rather than kwhr. [redacted] not concerned with the annual output, but was only obligated to keep the production rate equal to or above the installed capacity. [redacted] the rate of production was maintained continuously. This would mean a use factor (use factor $\frac{\text{kwhr}}{\text{kw}} = \frac{\text{output}}{\text{installed capacity}}$) of over 8,760 for the high capacity power plants. 25X1 25X1 25X1

5. The expression 35/60, 10/110, etc., indicates the step-up or step-down ratio of a transformer. The first figure represents the primary voltage and the second figure the secondary voltage in thousands of volts. The expression 10/110 is the turns ratio of 11 to 1 step-up. This appears throughout the report.

6. Sándor CZOTTNER in the article is referred to as "Minister for Heavy Industries". [redacted] he was "Minister for Mines and Electric Power Plants" [redacted] 25X1

7. The official name of this plant was the Borsod Thermal Power Plant; it was located immediately northwest of SAJÓSZENTPÉTER. This plant was also referred to as the Kazincbarcika Power Plant because of its close location to this plant.

C-O-N-F-I-D-E-N-T-I-A-L

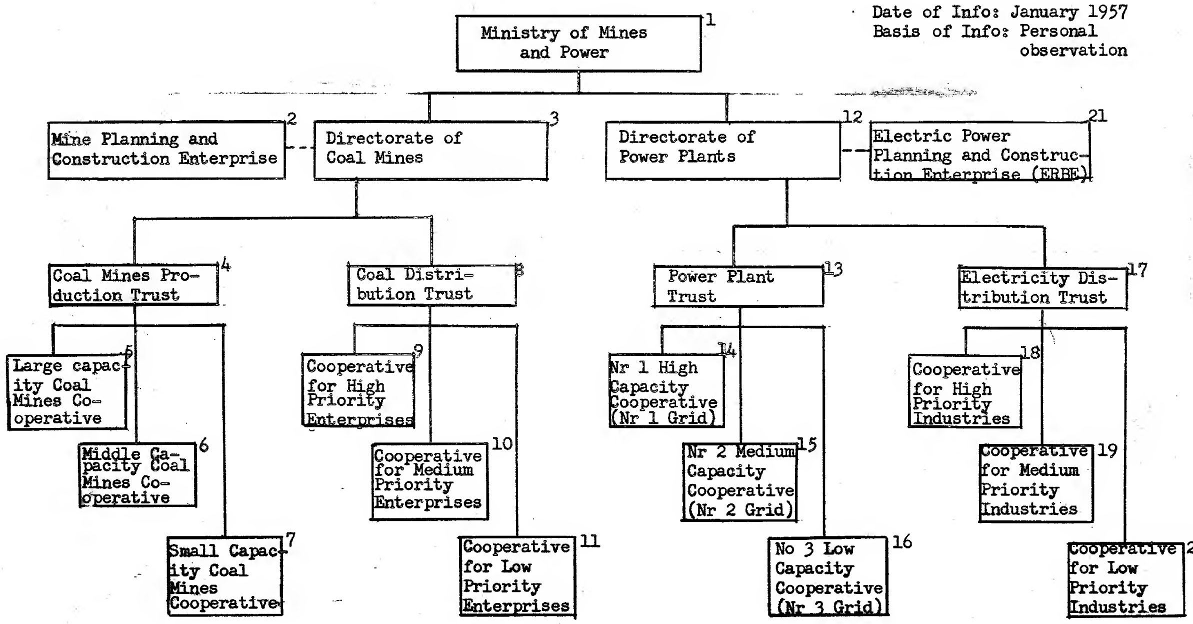
25X1

Annex B

25X1

[redacted] the Organization of the Ministry of Mines and Power

Date of Info: January 1957
Basis of Info: Personal observation



C-O-N-F-I-D-E-N-T-I-A-L

-31-

C-O-N-F-I-D-E-N-T-I-A-L

25X1

Legend to Annex B

The following enterprises were under the direct supervision of the Mines and Power Ministry:

1. The minister and vice minister of the Ministry of Mines and Power were respectively Sándor CZOTTNER and László HIDAS. CZOTTNER was a member of the Communist Party.

2. Mine Planning and Construction Enterprise (Bánya Tervező és Épitő Vállalat) was an administratively independent enterprise for planning construction and reconstruction of coal mines. It received its orders from the Ministry for Mines and Power Plants and in turn gave out construction projects to the Ministry for Furnace and Machine Industries. The offices were located in BUDAPEST V, Szabadság Ter Number 5 and 6.

3. Directorate of Coal Mines (Bánya Ipari Igazgatóság - BII) located at Markó Utca 16, BUDAPEST. The director was KOVÁCS (fnu), who was also deputy to the minister of Mines and Power on coal matters. The function of the Directorate of Coal Mines was to direct and control the following trusts:

4. Coal Mines Production Trust (Bányászati Tröszt). This trust was divided into the following cooperatives:

5. Large Capacity Coal Mines Cooperative.
This cooperative directed the coal output of the Petőfi Mines in LŐRINCI and GYÖNGYÖS which produced 3,000 tons of lignite daily rated at 1,500 kcal/kg.

6. Middle Capacity Coal Mines Cooperative.
This cooperative directed the coal output of the mines in KAZINCBARCIKA (Borsod), SAJÓSZENTPÉTER, SZUHAKÁLLÓ, KIRÁLD, HERBOLYA, DISZNÓSHORVÁT, RUDOLFTELEP, and eight unrecalled mines. The average calorific rating at this coal was 3,000 kcal/kg.

7. Small Capacity Coal Mines Cooperative.
This cooperative directed the coal output of the mine in EDELÉNY and about 20 other unrecalled mines.

8. Coal Distribution Trust (Szén Elosztó Tröszt).
This trust was divided into three cooperatives which distributed the coal according to priority set by Ministry of Heavy Industry. The cooperatives are as follows:

9. Cooperative for High Priority Enterprises.
This cooperative distributed coal to the Csepel Steel Plant in BUDAPEST, steel plant in SZTÁLINVÁROS, steel plant in DIÓSGYÖR, thirty-nine thermal power plants, and other unrecalled heavy industries.

10. Cooperative for Medium Priority Enterprises.
This cooperative distributed coal to the State Railways (Magyar Állam Vasutak - MÁV), post offices, radio stations, military installations, and civilian consumers.

11. Cooperative for Low Priority Enterprises and Civilian Consumers.
This cooperative distributed coal to low capacity thermal power plants in light industries and civilian consumers.

[redacted]

Legend to Annex B (cont'd)

12. Directorate of Power Plants (Villany Ipar Igazgatóság - VII) located at Markó Utca 16 in BUDAPEST. This directorate was responsible for the administration of the power plants. The distribution of power also came under its realm of responsibility.

The director and vice director were respectively László ERŐS and Ödön KERÉNYI. Both were members of the Communist Party.

[redacted] 25X1

13. Power Plant Trust located at Iskola Utca 13 in BUDAPEST I (See Annex C). The Power Plant Trust was responsible for the over-all control of 52 power plants which constituted the three cooperatives. According to plans for 1956 the Power Plant Trust was to provide power to Hungary's 25X1 industry and private consumers at a constant rate of 1,200,000 kw/hr.

The director of the Trust was Sándor CZENTERICS. The vice director and chief engineer of the trust was Elemér HAJDU. HAJDU, a former Arrow 25X1 Cross Party (Nazi) member, [redacted] Vilmos GYÖRGY assisted HAJDU in technical matters.

Subordinate to the Power Plant Trust were the following three cooperatives:

14. The Number 1 Cooperative of High Capacity Power Plants. All power plants with an installed capacity of 30,000 kw or higher belonged to this cooperative and formed the Number 1 Grid (110 kv). 25X1

[redacted]

15. The Number 2 Medium Capacity Cooperative. All power plants with an installed capacity of 10,000 to 30,000 kw belonged to this cooperative and formed the Number 2 Grid (60 kv). The Division Chief and Chief Engineer was Miklos ZÁRAI, who was not a Communist Party member.

16. The Number 3 Low Capacity Cooperative. Selected power plants with an installed capacity of less than 10,000 kw belonged to this cooperative and formed the Number 3 Grid (35 kv).

17. Electricity Distribution Trust (Árameloszto Tröszt - AT), located in BUDAPEST. This trust was responsible for the distribution of electric power to the consumers. The actual distribution was further delegated to the following three cooperatives:

18. Cooperative for High Priority Industries. All heavy industries were supplied by this cooperative with highest priority given to the Csepel Steel Plant, Sztalinváros Steel Plant and the Diósgyőr Steel Plant. Coal mines were also supplied by this cooperative.

Legend to Annex B (cont'd)

19. Cooperative for Medium Priority Industries.
The Hungarian State Railways, post offices, radio stations, and military installations were among the consumers supplied by this cooperative.

20. Cooperative for Low Priority Industries.
Light industries and private consumers were supplied by this cooperative.

21. Electric Power Planning and Construction Enterprise (Erőmű Beruházó, és Építő Vállalat - ERBE) located in BUDAPEST at Széchenyi Rakpart 3. ERBE was a state owned company which was jointly controlled by the Ministry of Mines and Power and the Ministry of Housing and Public Construction. It was under the administration of the Directorate of Power Plants and Directorate of Coal Mines. This enterprise planned and constructed all new power plants and coal mines.

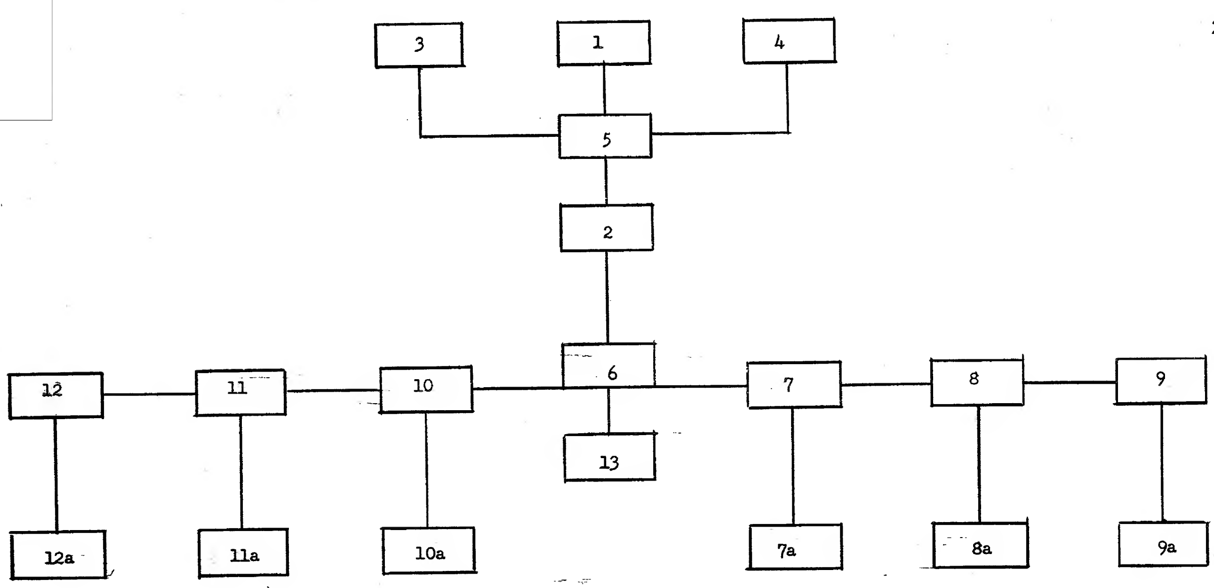
C-O-N-F-I-D-E-N-T-I-A-L

-35-

Annex C

the Organization of the Power Plant Trust of the Hungarian Ministry for Mines and Power

25X1



25X1

C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex C

1. **Director of the Power Plants Trust, Sándor CSENTERICS**

2. **Assistant Director and Chief Engineer, Elemér HAJDU**

3. **Communist Party Secretary, KOCSIS (fnu)**

4. **Trade Union Secretary, JÁRKI (fnu)**

5. **Secretary, Mrs. MÉSZÁROS (fnu)**

6. **Technical Department Chief, Vilmos GYÖRGY: Chief Engineer**

7. **Chief for Number 1 Cooperative of High Capacity Power Plants (110 kv)**

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex C (Cont'd) [redacted] 25X1

[redacted]

Following the meeting at the Ministry of Mines and Power, the Directorate of Power Plants held monthly meetings (one day) between the 20th and 25th of each month, where all decisions of the meeting held at the Ministry of Mines and Power were discussed and then included in the existing plans for the following month.

7a. Number 1 High Capacity Transmission Grid; all the high capacity power plants cooperated in a 110 kw transmission net.

8. Chief of Number 2 Cooperative for Medium Capacity Power Plants of 10.000 to 30,000 kw capacity was Miklós ZÁRAI: a chief machine engineer [redacted] 25X1

8a. Number 2 Medium Capacity Transmission Grid; most of the medium capacity power plants cooperated on the 60,000 volt transmission net.

9. Chief of the Number 3 Cooperative for Small Capacity Power Plants was István KARDOS; a chief machine engineer [redacted] 25X1

9a. Number 3 Small Capacity Transmission Grid; all the small capacity power plants cooperated on a 35,000 volt transmission net.

10. Administration Department; the department chief was Bertalan TARCZA [redacted] 25X1

10a. Finance
Material Procurement
Planning
Bookkeeping

25X1

[redacted]

Legend to Annex C (Cont'd)

25X1

11. Bookkeeping Department's Chief was Mrs. RÉVAI (fnu) [redacted]

11a. Bookkeeping Personnel.

25X1

12. Material Procurement Section; the chief was Mrs. KOVACS (fnu) [redacted]

25X1

12a. Material Procurement Section Personnel.

13. Personnel Department Chief was ZERGI (fnu) [redacted]

25X1

C-O-N-F-I-D-E-N-T-I-A-L

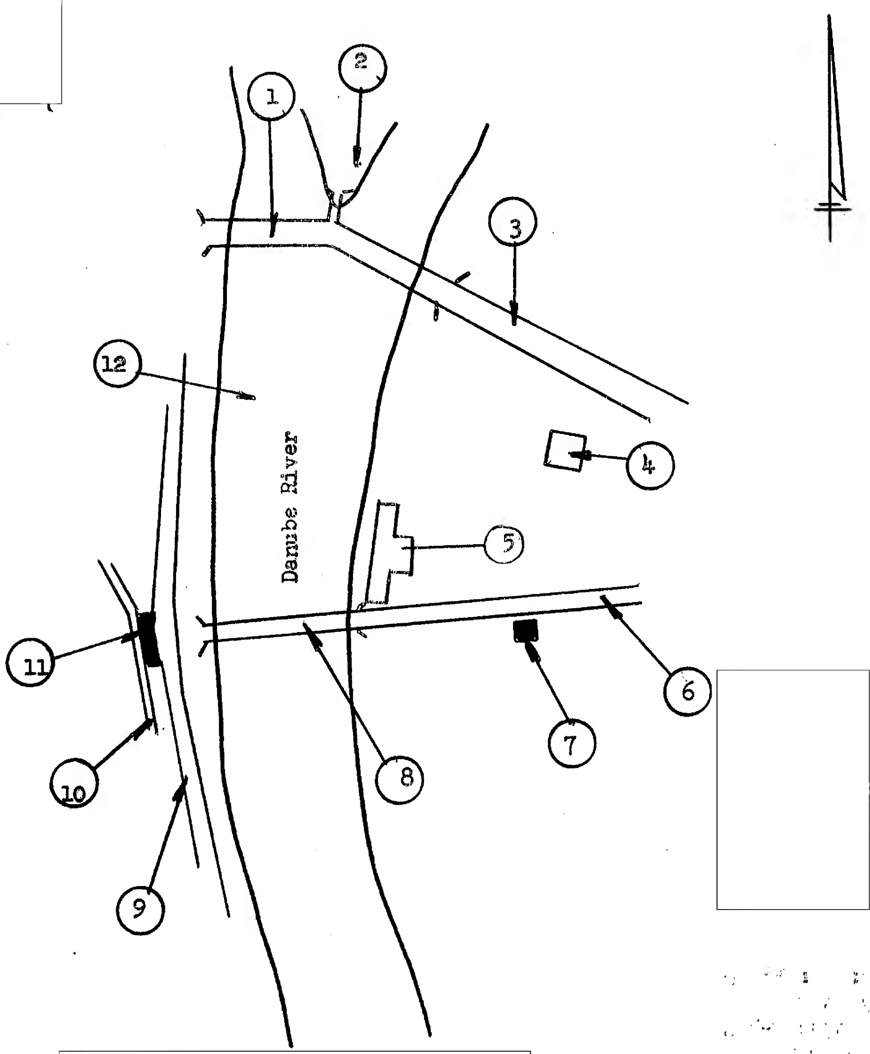
Annex D

Approximate Location of the Power Plant Trust's Control Centers

25X1

Scale: 1:15,000

25X1



25X1

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Sanitized Copy Approved for Release 2010/05/14 : CIA-RDP80T00246A042100120001-0

Legend to Annex D

1. Margit Bridge of iron and concrete construction about 600 m long and 12 m wide which spanned the Danube River.

2. Margit Island

3. Szent István Körut

4. Mine and Electric Power Ministry located on Markó Utca 16. It was a three-story brick building measuring about 600 x 600 m.

5. Hungarian Parliament Building.

6. Báthory Utca.

7. The Power Trust Control Center was located on the ground floor of a four-story brick structure. Two electricians were on duty to control the distribution of electric power during evening hours, weekends, and holidays. The control of the 110 kv transmission grid was directed from here by the use of carrier communication equipment. [redacted] information on the control and distribution of the electric power was classified as secret. Therefore, all electricians on duty here were members of the Communist Party, chosen because of their trustworthiness, and were paid relatively high salaries. Entrance to this installation was strictly forbidden to unauthorized persons. The upper floors of this four-story building were apartments. It was unknown to the populace that this building was occupied by the Power Plant Trust Control Center. This installation was completed between 1950 and 1951. The two electricians on duty each shift were able to control the output of the electric power plants by means of the instrument board. They were connected by direct telephone lines to all of the power plants, because entry into the Power Plant Trust Control Center was prohibited during the night hours.

8. Kossuth Bridge, of iron and concrete construction; it was built in 1946. It was of such inferior construction that since the spring of 1956 only pedestrians could use it.

9. Fő Utca.

10. Iskola Utca. The entrance to the Power Plant Trust of the Mine and Power Ministry was located on this street.

11. Power Plant Trust Building; a three-story, red brick building measuring about 50 x 10 x 14 m. [redacted] The Power Plant Trust was actually located on the second floor of the building. Entrance to the building from Iskola Utca was restricted to those with identity cards. The control center for power distribution was also located on the second floor; entrance to this center was restricted to all except the director of the power trust, his assistant, and the electricians on duty. The control room, by means of instruments, could check and control the power output, frequency and the total voltage of the power plants within the high capacity grid. When, for example, power shortage was noticed, the respective power plant was immediately notified by using the carrier telecommunication system and the power plant had to justify the power shortage. Any disturbances in the transmission grid were immediately signalled by a horn and a red light which remained on until the disturbance was corrected. The control room measured approximately 5 x 5 x 4 m. The switch board was divided into 14 equal control panels on which surveying and distribution instruments were installed. Each panel belonged to a power plant and each

Legend to Annex D (Cont'd)

power plant had an identical installation. The control room was operated by two electricians who were on duty between 0800 and 1700 hours. All instructions to the power plants had to have the prior approval of the director of the Power Plant Trust, Sándor CSENTERICS, assistant director Elemér HAJDU or of the chief of the technical department and chief engineer Vilmos GYŐR.

12. Danube River.

25X1

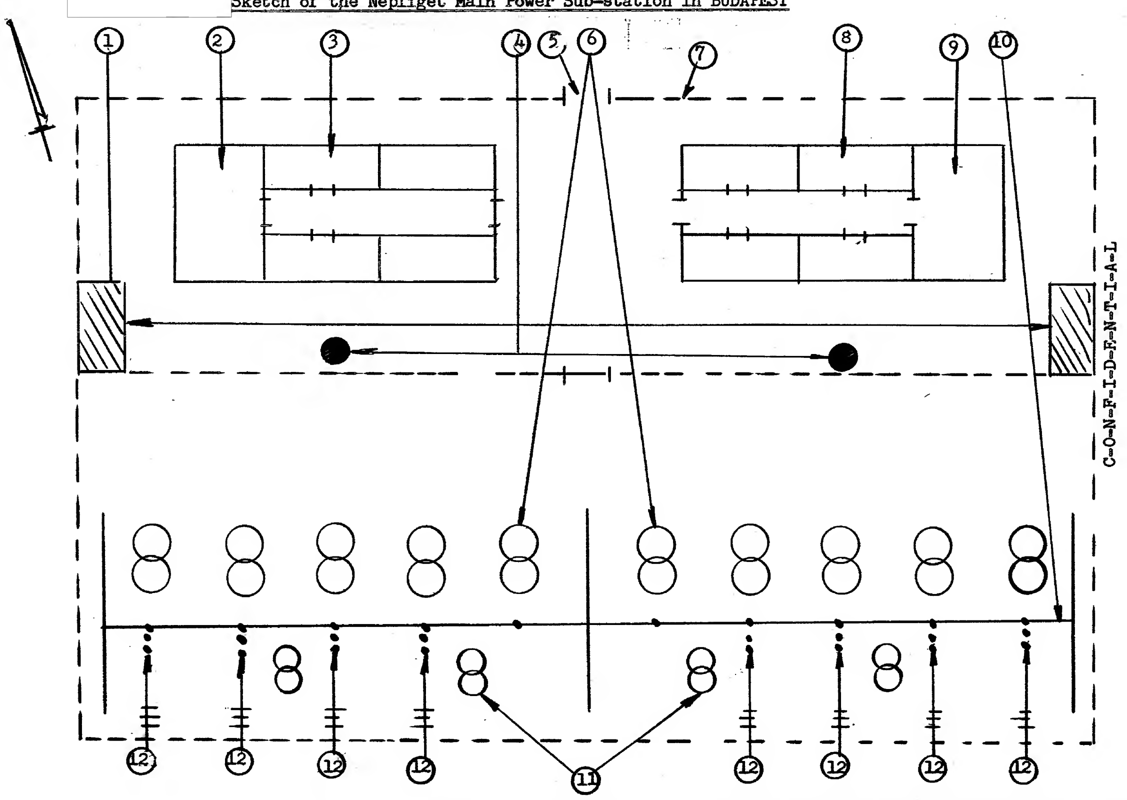
C-O-N-F-I-D-E-N-T-I-A-L

-42-

Annex E

Sketch of the Nepliget Main Power Sub-station in BUDAPEST

25X1



C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex E

The entrance to the sub-station was always closed; one of the electricians on duty would open the door to authorized persons upon proper identification.

1. Two concrete sand bins, each had iron doors on top and each contained three tons of sand to be used in case of fire.

2. Relay room; all power switches were located in this room.

3. Brick building measuring 10 x 6 x 5 m; it had a flat concrete roof. Offices, storage rooms for measuring instruments, and dressing rooms were located here.

4. Foam extinguisher, to be used in case of electric fires.

5. Entrance about four m wide with a double-winged door which was always closed. One had to ring the bell to gain entrance to the compound.

6. Ten transformers manufactured by the Ganz Electrical Works. They were the closed type which could be switched on in parallel, any number, to the incoming high tension line.

7. Fence, two m high of mesh wire, with barbed wire on top, surrounded the sub-station.

8. Building of the same construction as item 3 above. It was used to store spare parts for the sub-station; it also housed some offices.

9. Power sub-station control room; it had the same function as item 2 above; two electricians were on duty here. It contained all the power switches for the high capacity transmission grid. The signal equipment and storage batteries were operated on 24 volts. Orders to switch power were received from the control office of the Power Plant Trust. However, this room could also control the power distribution independently, through the carrier telecommunications system.

10. High tension tower supporting eight high voltage transmission lines, equipment with circuit breakers.

11. Four voltage regulators.

12. High voltage transmission lines for the eight high voltage transmission lines in the grid.

 25X1

C-O-N-F-I-D-E-N-T-I-A-L

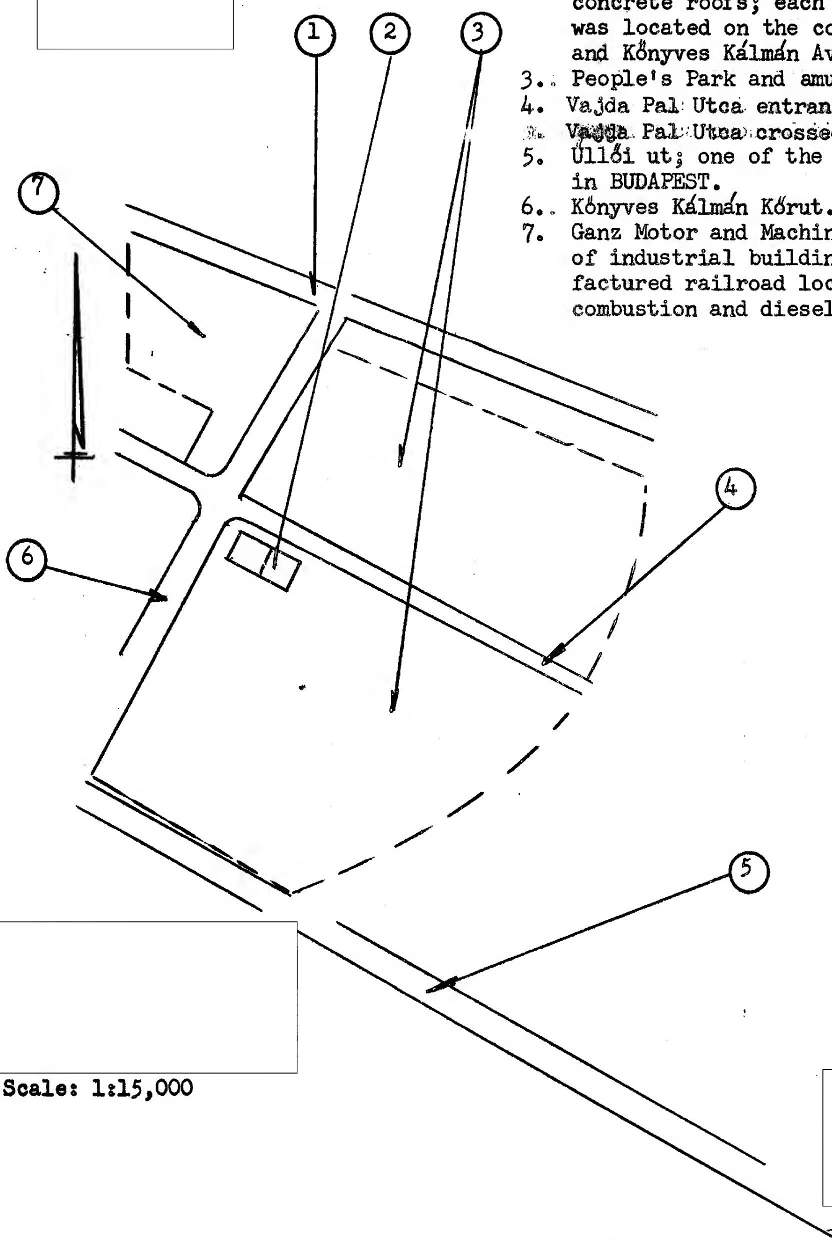
Annex F

Approximate Location of the Nepliget Sub-station

25X1

Legend:

1. Köbányai Ut
2. Népliget Sub-station consisted of two one-story, brick buildings with flat concrete roofs; each 10 x 6 x 5 m. It was located on the corner of Simon Utca and Könyves Kálmán Avenue in BUDAPEST.
3. People's Park and amusement park.
4. Vajda Pal Utca entrance to power sub-station.
   Vajda Pal Utca crossed the People's Park.
5. Üllöi ut; one of the main thoroughfares in BUDAPEST.
6. Könyves Kálmán Körut.
7. Ganz Motor and Machine Plant; a complex of industrial buildings which manufactured railroad locomotives, internal combustion and diesel engines.



Scale: 1:15,000

25X1

25X1

C-O-N-F-I-D-E-N-T-I-A-L

25X1

C-O-N-F-I-D-E-N-T-I-A-L

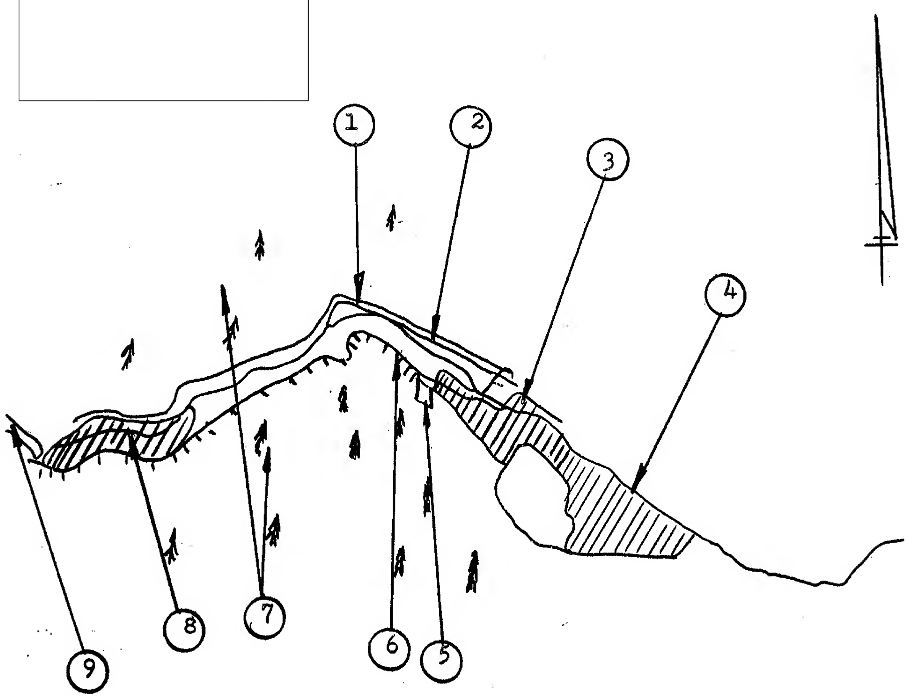
Annex G

Pinpoint Location of the Diósgyőr Power Sub-station

25X1

25X1

Scale: 1:50,000



25X1

Legend

1. A LILLAFÜRED - MISKOLC road; 6 m wide; concrete.
2. Szinva River; about three meters wide and one meter deep mountain brook with swift currents.
3. Outskirts of the cities of DIÓSGYŐR and MISKOLC; total population of about 160,000.
4. Szinva River, same as item 2 above.
5. Diósgyőr Power Sub-station.
6. Narrow gauge railroad line connecting MISKOLC with LILLAFÜRED; it carried passengers and freight traffic.
7. Bukk Mountains; covered with deciduous and pine trees.
8. LILLAFURED; a resort town.
9. Lake Hámor.

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex H

1. The plant area was 800 x 800 m. A mesh wire fence, about two meters high, mounted on concrete poles and topped with barbed wire enclosed three sides of the sub-station; the east side was enclosed by a brick wall, 80 m of which was the building shown as item 15 below.

2. The 12 transformers had a ratio of 35/110 kv, 60/110 kv, and 35/60 kv; their capacity was unknown.

3. Transmission tower of iron construction; it supported four transmission lines and was about 10 to 20 m high.

4. Voltage regulators.

5. Chain insulators for the high voltage transmission cables.

6. Foam extinguishers recessed into concrete, they were about 1.5 m high and 1 m high in diameter, used for electric fires.

7. Sand storage bins constructed of concrete with iron doors on the top, each contained three tons of dry sand to be used in case of fire.

8. Building, two-story, brick structure about 150 x 8 x 8 m, with a flat concrete roof. The upper floor contained two apartments for two electricians.

9. Control room Number 1, with automatic control boards located on the ground floor of the building (item 8 above).

10. Entrance about six meters wide, with a wooden gate which was kept closed.

11. Control room Number 2, same as item 9 above.

12. Same as item 7 above.

13. Same as item 2 above.

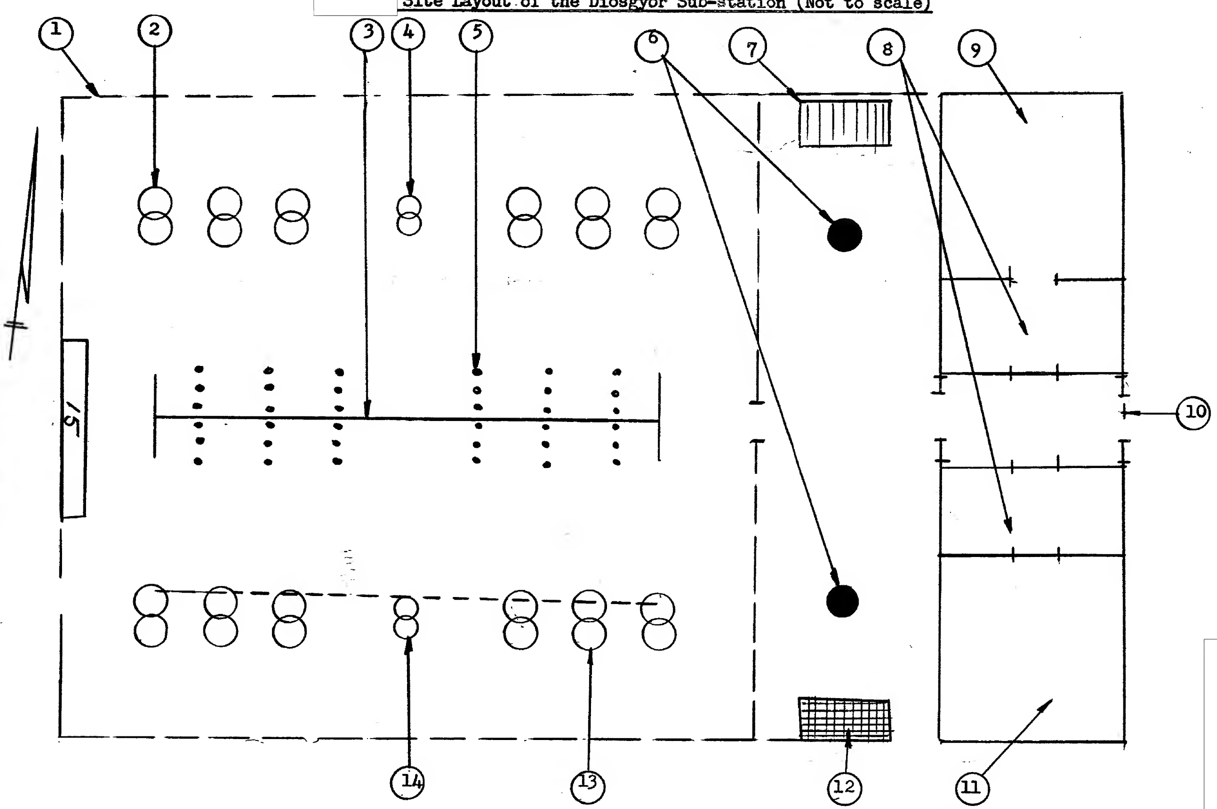
14. Same as item 4 above.

15. Building, 80 x 20 x 4 to 5 m, its center part for about 20 m was 8 m high. It contained the switch house, offices, workshops, warehouse, garage and the guard's room. The second floor had two apartments for the two chief electricians, one of whom was always on duty.

25X1

Annex H

Site Layout of the Diósgyőr Sub-station (Not to scale)



C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L

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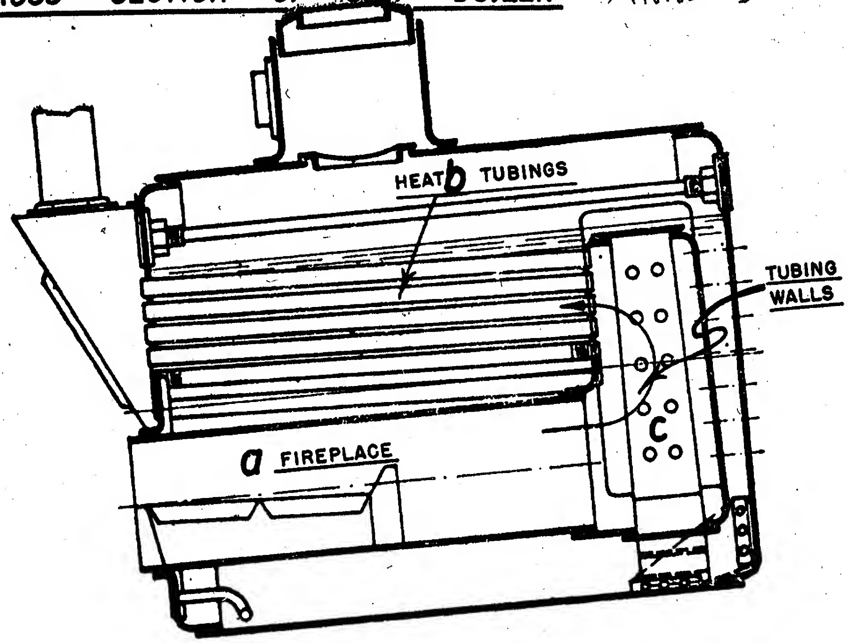
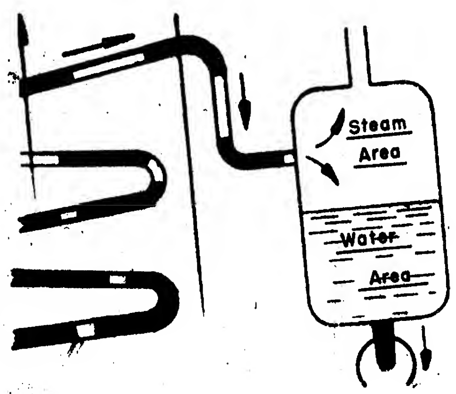
CONFIDENTIAL

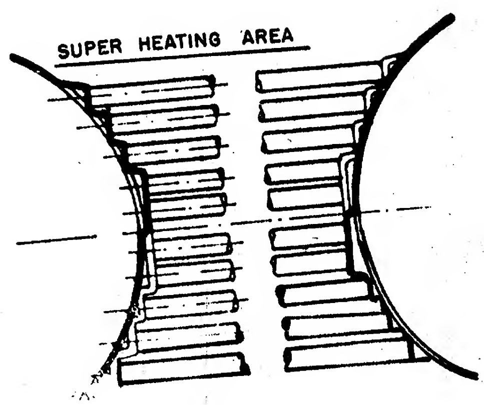
25X1

CROSS SECTION OF SHIP BOILER

ANNEX I







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CONFIDENTIAL

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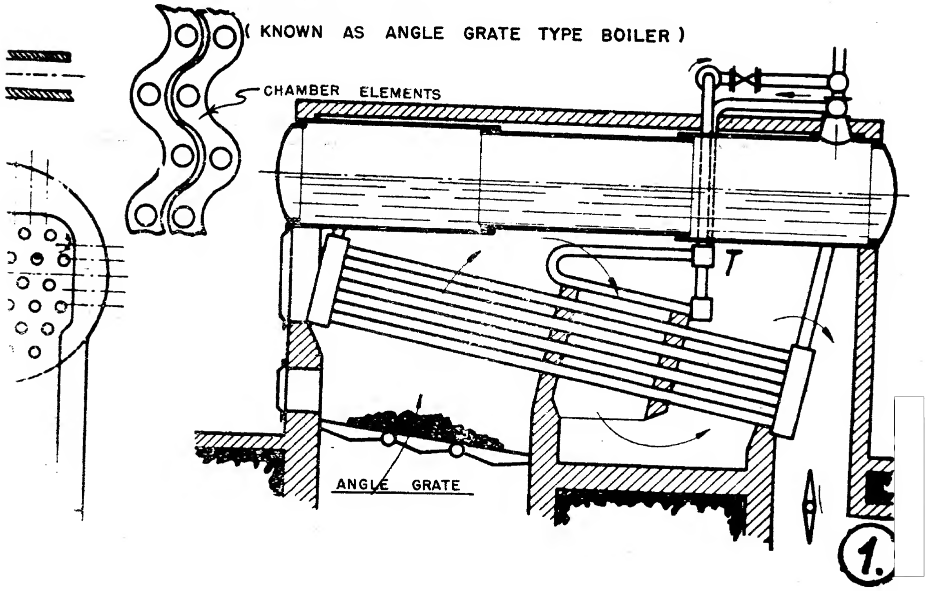
ANNEX J

CROSS SECTION OF BABCOCK - WILCOX BOILER

(Babcock - WILCOX

(KNOWN AS ANGLE GRATE TYPE BOILER)



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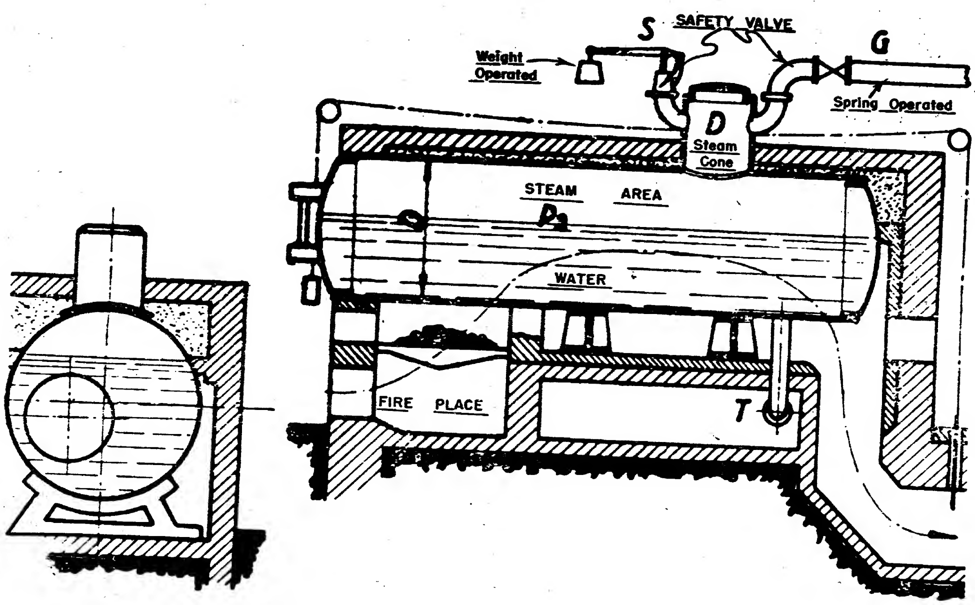
ANNEX K

CROSS SECTION OF AXLE TYPE BOILER



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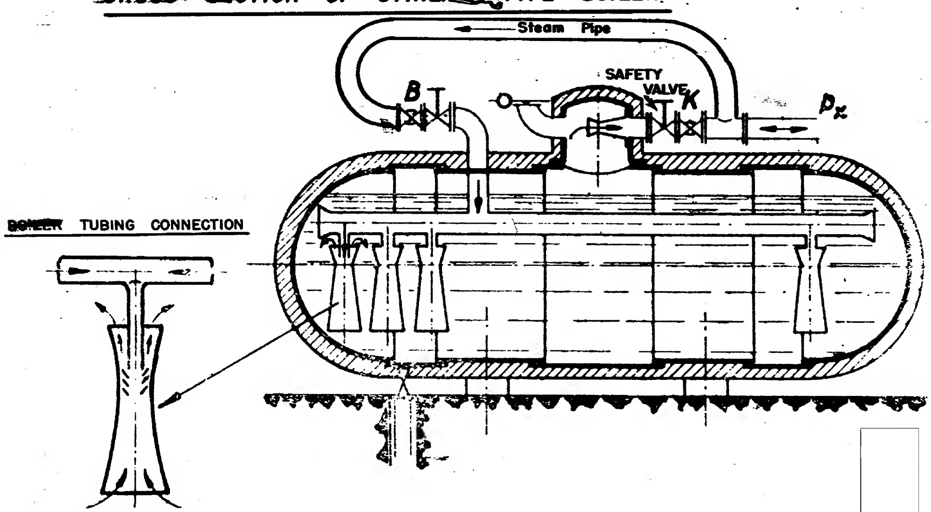
ANNEX L

~~CROSS SECTION OF STIRLING TYPE BOILER~~



25X1

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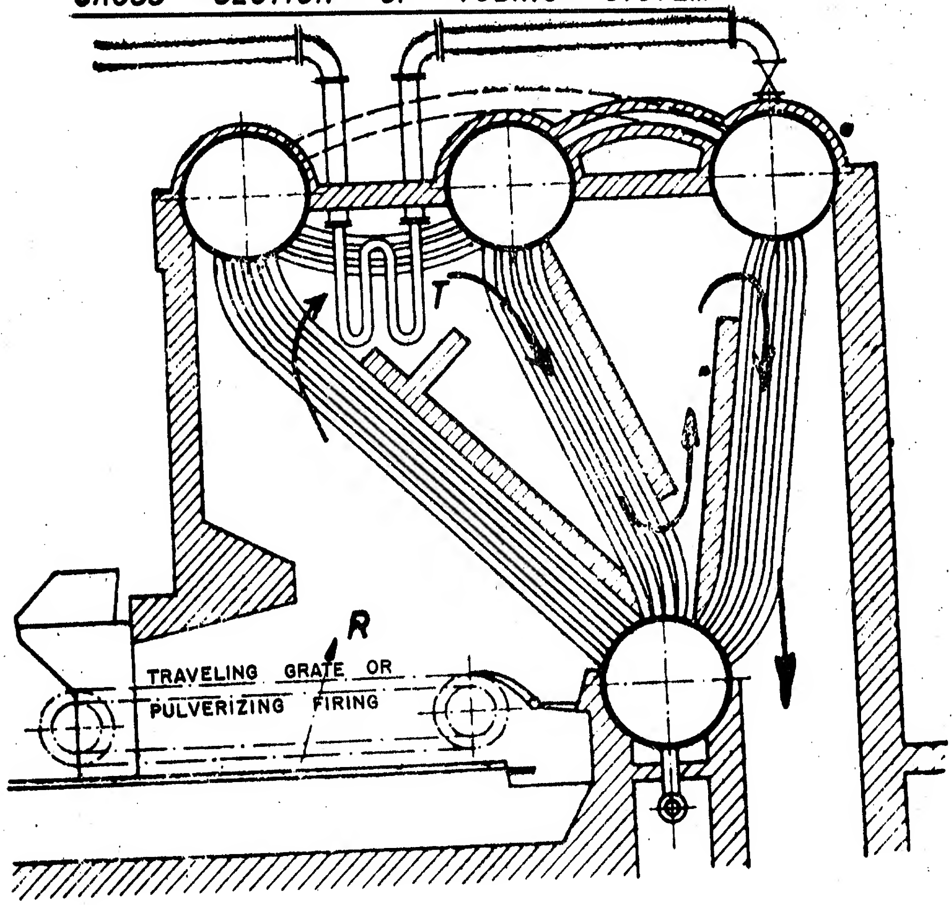
M

ANNEX

CROSS SECTION OF TUBING SYSTEM



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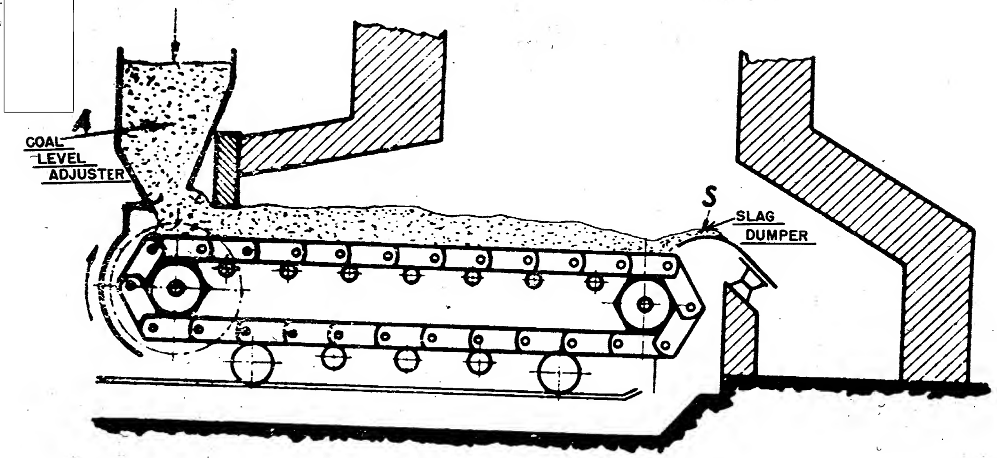
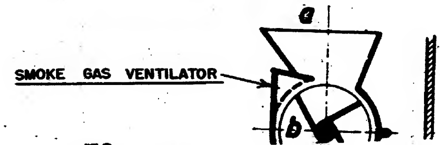
ANNEX N

CROSS SECTION OF TRAVELING GRATE

25X1





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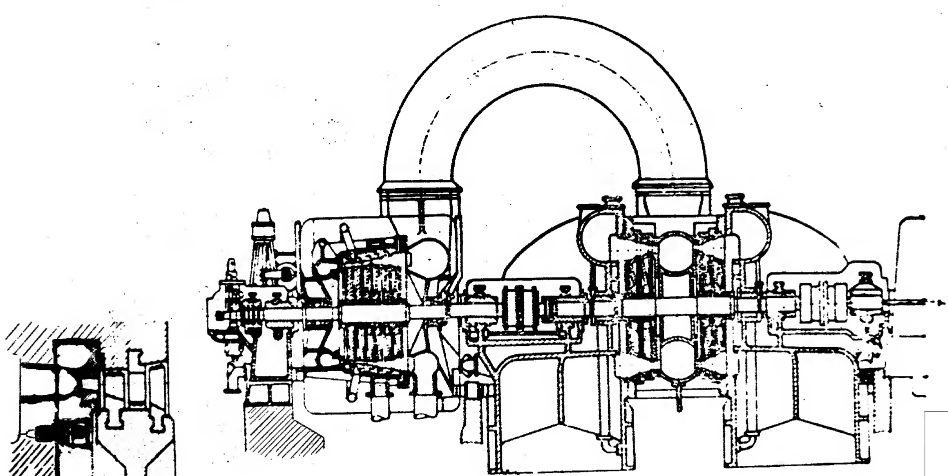
[redacted] O

TWIN HOUSING "ZOELLY" TURBINE



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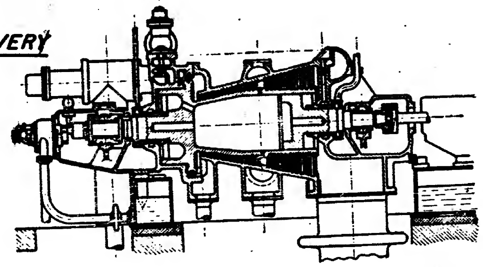
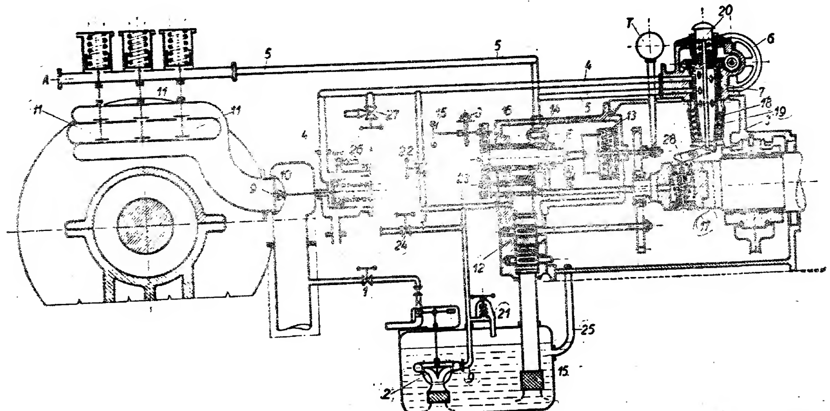
ANNEX P

CROSS SECTION OF BROWN-BOVERY COMPANY TURBINE





25X1

(13)

CROSS SECTION BROWN-BOVERY COMPANY TURBINE GOVERNOR

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25X1

Legend to Annex P

The points numbered 2,3,4,5,6,7,8,9,10,11,12,13,15,17,18,20 and 23 below, could be serviced by the power plant's personnel. All other points were serviced by trained personnel of the plant which manufactured the turbine's governor.

1. Air exhaust valve.
2. Oil pump for start of steam operated turbine.
3. Oil tubing to ballbearing housing.
4. Oil tubing.
5. Main oil tubing.
6. Hand wheel for start of operation.
7. Start and quick-closing valve.
8. Oil pressure starting pump (not shown).
9. Main steam locking valve.
10. Stabilizing valve.
11. Main stabilizing valves.
12. Operation oil pump.
13. Operation regulator.
14. Membrane to oil feeder.
15. Hand wheel and electric motor parallel switch.
16. Oil pump.
17. Safety regulator.
18. Start and quick-closing valve.
19. Base of driving gear.
20. Emergency stopping button.
21. Adjustable counter-pressure spring.
22. Oil pressure control valve.
23. Oil control valve.
24. Air release valve.
25. Pipe connection.
26. Governor valve.
27. Membrane control valve.
28. Automatic oil pressure valve.

A. Main oil feed pipe.

E. Control slide

L. Safety oil inspection valve.

J. Air control valve.

N. Oil distribution valve.

T. Unidentified.

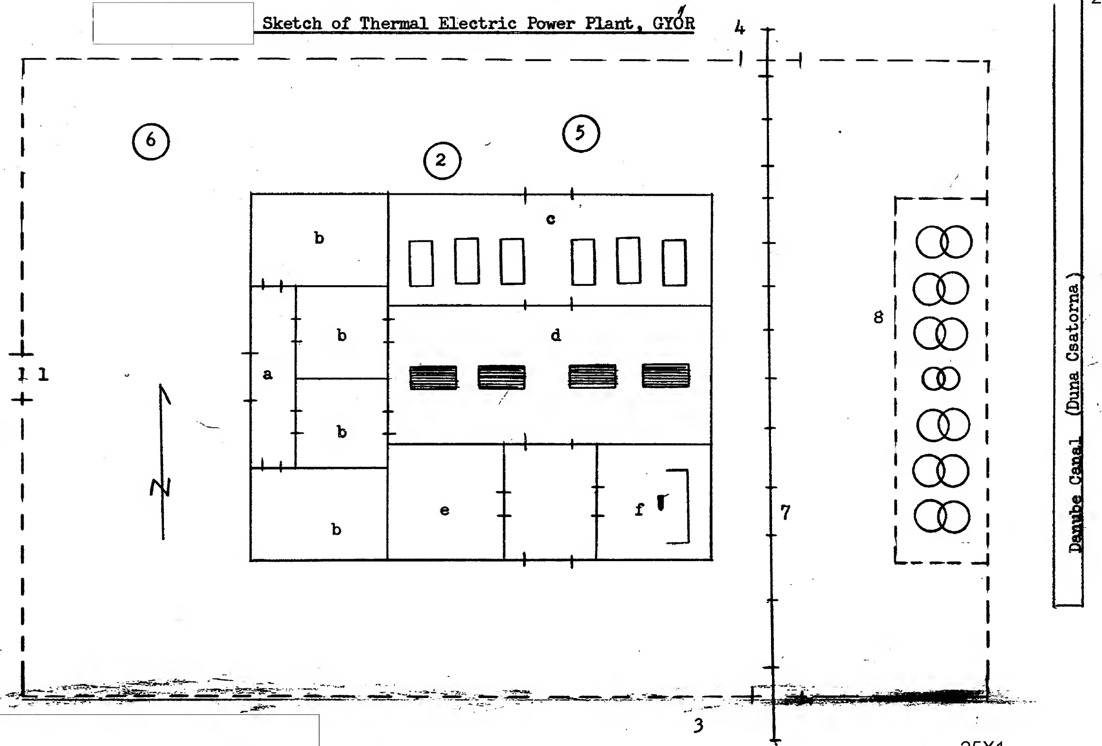
25X1

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Annex Q

Sketch of Thermal Electric Power Plant, GYŐR



C-O-N-F-I-D-E-N-T-I-A-L

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Legend to Annex Q

The plant covered an area of 800 x 1,600 m which was surrounded by a mesh fence 2 m high.

1. Entrance, double wing iron door, continuously open and unguarded.

2. Main thermal power plant building, 80 x 140 m , two-story, old reinforced brick structure, with hangar type roof, except for roof above the offices which was flat. It contained the following:

   a. Doorman's booth and plant lobby.

   b. Four offices used by the plant administration.

   c. Boiler house; contained six Babcock and Wilcox (5 tph), traveling grate type boilers.

   d. Turbogenerator house, with overhead traveling crane of unknown capacity. It contained four ZOELLY type condenser type turbogenerators, including two, five-megawatt and two, two-megawatt units.

   e. Carrier communication equipment operated by technician in charge of the control house. It served only the open transformer yard.

   f. Control house; contained an instrument board and an instrument control table.

3,4. Two railroad gates, each four m wide, open only when in use.

5,6. Coal and slag piles.

7. European standard gauge railroad track of the Gyor industrial town railroad net.

8. Open transformer yard, surrounded by mesh wire fence. It contained three 30,000 kw and three 10,000 kw transformers.

25X1

[redacted]

Annex R

25X1

[redacted] Pinpoint Location of the Györ Thermal Power Plant (3)

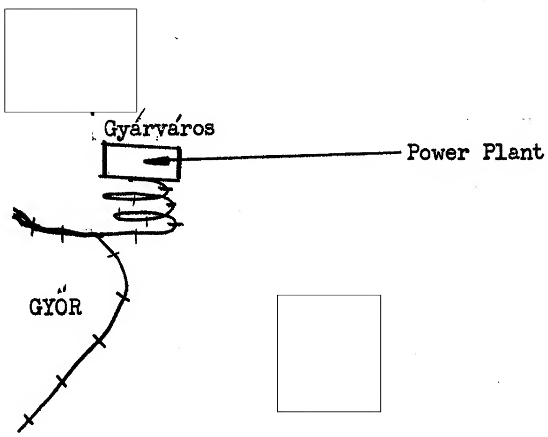
Map Ref:

Hungary 1:50,000

[redacted]

25X1

25X1



25X1

[redacted]

25X1

25X1

C-O-N-F-I-D-E-N-T-I-A-L

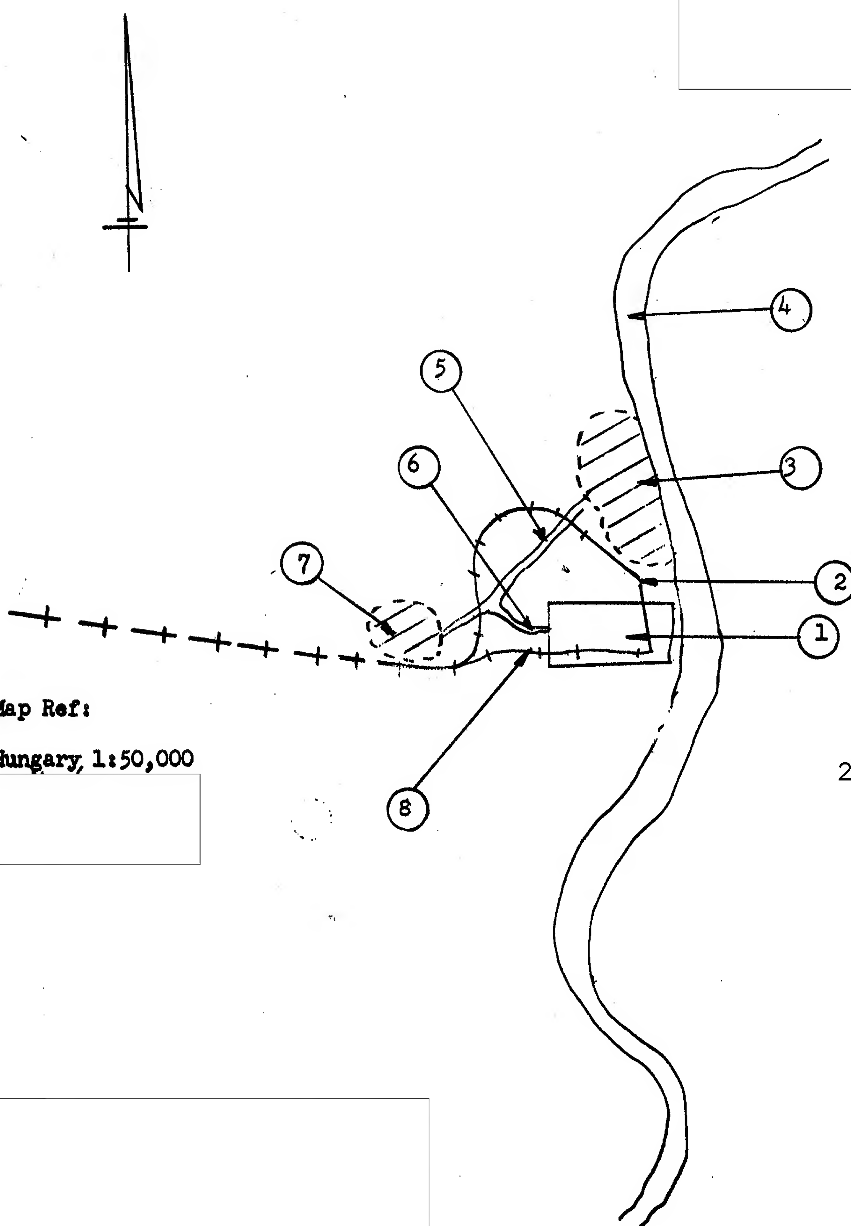
[redacted]

Annex S

Pinpoint Location of the Tiszapalkonya Thermal Power Plant (1)

25X1

[redacted]



Map Ref:

Hungary, 1:50,000

[redacted]

25X1

25X1

[redacted]

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex 8

1. Tiszapalkonya Thermal Power Plant, under construction. It was a flat, rectangular-shaped area approximately 1200 x 800 m.

2. Single railroad spur. This was not shown on the map. It branched off the main railroad line leading to MISKOLC near HEJÓPAPI.

3. Town limits of TISZAPALKONYA.

4. Tisza River.

5. Macadam road about four meters wide; in good condition.

6. Macadam road about four meters wide; newly built and in excellent condition.

7. Town limits of Tiszaoszlár.

8. Plant's railroad station.

25X1

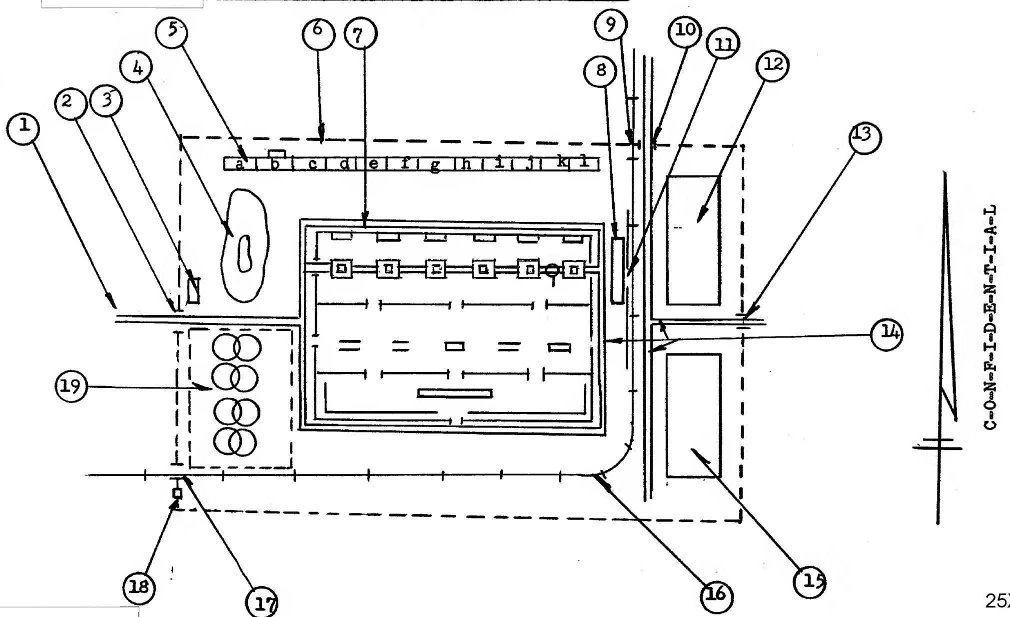
Annex S-1

25X1

Sketch of Tiszapalkonya Thermal Power Plant

C-O-N-F-I-D-E-N-T-I-A-L

-62-



C-O-N-F-I-D-E-N-T-I-A-L

25X1

Legend to Annex S-1

1. Road (see item 6, Annex S).

2. Gate, a double wing, steel door, five meters wide with a drop-bar.

3. Guard house, a one-story brick structure with a flat concrete roof, about 10 x 5 x 4 m . It contained a room where three to four civilian guards checked all persons entering, and a storage room where three hand pumps and six foam generators with extinguishers were stored.

4. Park, with trees in the center.

5. Storage building, one-story, brick structure, about 80 x 5 x 4 meters with a shed-type roof. All construction materials and machinery were stored in this building. This building consisted of the following rooms:

   a. Storage room, containing electrical instruments and small spare parts for turbines and boilers.

   b. Storage room and fuel station, containing about 200 drums each with a 200 liter capacity; they contained diesel turbine and other lubrication oils. The fuel station had two underground containers of 20,000 liters. They were connected by underground pipelines running along the fence (Item 6 below) to the railroad gate (Item 9 below) where the fuel was pumped out of railroad tank cars.

   c. Storage room, containing spare parts for turbines only. This storage was being used by Lang Machine Factory in BUDAPEST, which mounted the turbines.

   d. Storage room, containing spare parts for boilers only. This storage belonged to the Ganz Shipyard in BUDAPEST, which mounted the boilers.

   e. Storage room, containing firebricks and packing materials for boilers and pipes. This storage was used by the Boiler and Pipe Factory in BUDAPEST, which assembled the entire pipe system of the plant.

   f. Bath and shower room.

   g. Storage room, containing spare parts for electrical instruments and equipment. This storage room belonged to ERBE which performed all construction.

   h. Garage, containing three Pobeda, USSR made, automobiles.

   i. Storage room for equipment belonging to the State Road Construction Company in BUDAPEST, which performed all earthwork.

   j. Mess hall, used by workers employed by various companies which were engaged in building the plant.

   k. Storage room, containing beds, sheets, blankets, mattresses and pillows.

   l. Living room, for workers employed by the various building companies engaged in the plant construction.

6. Fence of mesh wire, supported by two-meter-high iron poles located five meters apart.

7. Power Plant Building, two-story, reinforced concrete construction with steel frame sky-lights, about 60 x 40 x 10 m.

Legend to Annex S-1 (Cont'd)

a. Boiler house, about 60 x 150 x 10 m.

b. Turbine house, about 60 x 150 x 10 m.

c. Control house, about 60 x 100 x 10 m. Containing switchboard along all four walls, by which the output of the turbogenerators was controlled. Control desk from which an electrical technician controlled the electrical power output of the plant and distributed the power of the turbogenerators evenly. An underground room running under the entire building contained the water tanks, air coolers, condensers, evaporators, coal pulverizers, feeder reactors, and cable vaults.

8. Underground pulverized coal storage area of concrete, five meters deep, open on top.

9. Railroad gate, double wing steel door, four meters wide; it was kept closed.

10. Gate, double wing steel door, four meters wide.

11. Crane, bridge tower transported on double rails, capacity 20 to 25 tons, used for unloading coal and turbines from railroad freight cars.

12. Multiple purpose building, two-story, brick construction, 24 x 12 x 8 m, with a flat concrete roof. The ground floor contained 6 steam turbines, 100 atomosphere; 6 water pumps, 6 electroturbines, 10 air compressors, 100 horsepower ; and 10 vacuum pumps, 100 horsepower. Technical offices and drawing rooms were located on the second floor.

13. Gate, double wing steel door, four meters wide which was kept closed. Only trucks carrying building materials used this gate.

14. Internal road system.

15. Administration building, two-story, brick structure 20 x 12 x 8 m, with a flat concrete roof. The ground floor contained a kitchen and mess hall for about 600 persons, a cinema, a reading room, a library and a dispensary; the second floor contained the manager's office, and offices for his secretary and bookkeeper.

16. Single standard gauge railroad spur.

17. Railroad gate, double wing, steel door, four meters wide.

18. Guard shack, brick, 4 x 4 x 4 m, with a flat, concrete roof.

19. Transformer yard, approximately 500 x 300 m open area enclosed by a mesh wire fence supported by concrete poles, two meters high and four meters apart. The yard contained four transformers rated at 60,000 kw and a ratio of 5/110 kv each, which were connected by underground cables with the control room. A 20,000 kw transformer for the small turbine generator was also located here.

25X1

Annex S-2

Tiszalpalkonya Thermal Power Plant (1)

1. History

Construction of the Tiszapalkonya Thermal Power Plant was planned and carried out by ERBE, and was included in Hungary's first five-year plan (1951 - 1956). This was to be the largest and most modern power plant in Hungary with an installed capacity of 240,000 kw. The project was approved by the Council of Ministers in September 1953. Construction work started in March 1954, most of the buildings were completed by 1 December 1956 (final completion date of the technical installation was scheduled for 1 December 1962). On the 1st of December of every year (1957 to 1960) one set of power units consisting of a turbogenerator and two boilers with a capacity of 60,000 kw were to be completed and put into operation. Between 1961 and 1962 automation and synchronization with the main electric power sub-station located in Nepliget, BUDAPEST, was to be completed. After completion, the plant was to be handed over to the Power Plant Trust and was to operate along with other power plants within the Number 1 High Capacity Grid. In June 1956,

25X1

2. Production Data

Since this plant was still under construction, no production data were or would be available until after 1 December 1957 when one turbogenerator with a capacity of 60,000 kw was scheduled to be put into operation.

3. Generating Units

This plant was to contain four turbogenerators, each with a capacity of 60,000 kw, three phase, 50 cycle. A fifth turbogenerator which was to supply power to the plant only, was to have a capacity of 20,000 kw. The turbogenerators were manufactured by the Lang Machine Factory, BUDAPEST 8, Váci Ut. The synchronized reciprocating engines, serving as prime movers for the turbogenerators, were manufactured by the Ganz Electric Works in BUDAPEST. They had a capacity of 80 to 420 kw.

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Annex S-2 (Cont'd)

[redacted]

4. Boilers

The power plant was to have six boilers, each with 160 tph capacity and operating pressure of 100 atm. The outstanding features of these boilers was that they could be automatically fired by four types of fuel: pulverized coal, chemical waste materials, dry gas or residual oil. The boilers were manufactured by the Crane Factory (darugyár), BUDAPEST 8, Váci Ut, which was formerly known as the Ganz Shipyards Boiler Section. The boilers feed circulation system was manufactured by the Lang Machine Factory. The auxiliary boiler feed consisted of 12 standby pumps which were erected for the six boilers. The prime movers for the boilers were electric motors and steam turbines.

5. Water Supply

The source of water supply for the boilers and cooling system was the Tisza River. The turbines had a circulating type of cooling system. The pumps were electrically driven by 500 hp motors. The water went through the following boiler feed stages:

Ballast or gravel filter.

Lime softener.

Deironing (equipment was received [redacted]) 25X1

Chemical softener.

Deacidizing equipment.

Chemical filter.

6. Fuel

This power plant was to be supplied primarily with chemical waste materials derived from the Tiszapalkonya Chemical Combine (the largest chemical plant in Hungary). (The Tiszapalkonya Chemical Combine, was also under construction together with a completely new settlement to house a population of approximately 20,000.) These materials were to be in the form of waste gases, nylon waste material and residual oil which was to be supplied by the Mezőkeresztes oil fields. The Tiszapalkonya Chemical Combine was to receive its supply of gas from Rumania through a system of pipe lines. These pipe lines to the combine were almost completed in December 1956, except for a small section which still had to be laid under the Tisza River. Concrete storage tanks for these waste materials were constructed under the Thermal Power Plant. During operations, the firing of boilers could be switched over automatically from one type of waste material to another without a stoppage or could be fired by all three waste materials at the same time. The power plant, in turn, was to supply the 12 plants of the Chemical Combine with waste steam. The firing of the boilers was planned and designed by the Hungarian Technical Institute for Firing. [redacted] In the initial period of operation, a mixed coal rated at about 3,000 kcal/kg was to be supplied by the Borsod coal mines. 25X1

7. Transformers

Four transformers each having a 60,000 kw capacity were located in the open, without covers. Each of the transformers stepped up electric power at a ratio of 10/110 kv. The transformers were connected by underground cables to

C-O-N-F-I-D-E-N-T-I-A-L

25X1

[redacted]

the control house. Another smaller transformer of 20,000 kw capacity for use with the small turbogenerator was also located in the open. The oil capacity of each transformer was 800 liters. They had Delta connections and core-type radiators as coolers. The transformers were manufactured in early 1956 by the Ganz Electric Plant , BUDAPEST 2, Lövöház Ut.

8. Transmissions

The high voltage transmission lines were part of the Number 1 High Capacity Grid. The conductors were of reinforced aluminum with a cross-sectional area of 60 sq mm. They were hung on a 16-meter-high steel tower with 50 centimeter porcelain chain insulators. Two transmission lines ran from the plant. One of them went to the Népliget Power Station and another to the Diósgyör Power Station. The current was AC, 50 cycle.

9. Plant Installation and Equipment

Installation of equipment was performed by the following companies: 25X1

[redacted] all electrical instruments, relays, and automatic registration instruments [redacted] all voltage regulators, voltage transformers and vario meters; unrecalled companies [redacted] automatic ventilator, water and steam control instruments, and caloric instruments [redacted] 25X1 unrecalled companies in Czechoslovakia, all pipe insulations; Ganz Shipyards, Hungary, BUDAPEST 8, Váci Ut, boilers with accessories; Ganz Electric Machine Factory, BUDAPEST 2, Lövöház Ut 10, electric installation and equipment; Lang Machine Factory, BUDAPEST 8, Váci Ut, all turbines with spare parts. [redacted]

25X1

10. Labor Force

The plant employed about 1,200 workers, including those involved in the plant's construction. About 20 foremen employed at the plant were trained at the Mátravidék Thermal Power Plant in Lörinci; 10 engineers were trained in the Borsod Thermal Power Plant in KAZINCBARCIKA.. Several electricians and specialist were hired from other power plants.

11. Security Measures

The plant was guarded by 20 to 25 civilian guards, armed with rifles. All other power plants in Hungary were guarded by AVH guards.

12. Recent Reports

The following article appeared on the front page of the 12 December 1957 issue of the Hungarian daily 'Népakarat' official newspaper of the Hungarian Trade Unions:

"TISZAPALKONYA will celebrate 50 million watts on Friday"
"The Tiszapalkonya Thermal Power Plant's first power unit of 50 mw had operated continuously for 30 days without interruption. With this the service test had been successfully completed. The power unit will be turned over formally for operation on Friday 11 AM. The official address will be delivered by Sándor CZOTTNER, Minister of Heavy Industries, who will also present government decorations and awards to the workers".

C-O-N-F-I-D-E-N-T-I-A-L

-68-

Annex T

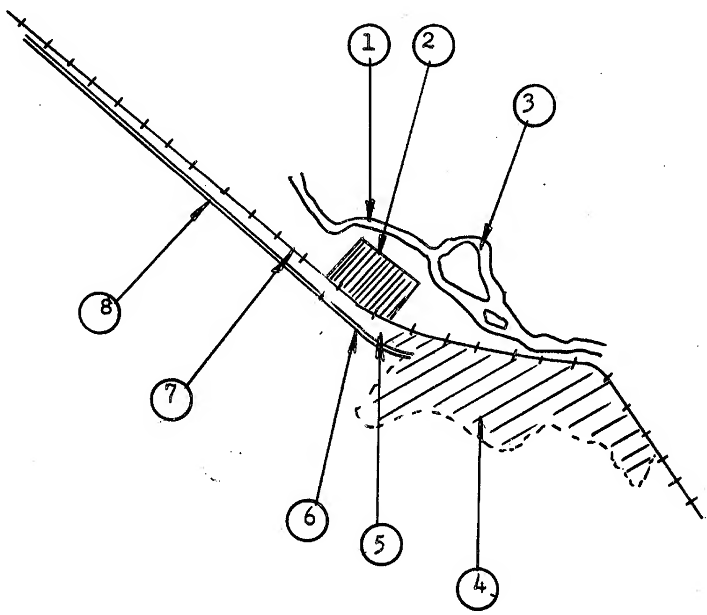
Pinpoint Location of Borsod Thermal Power Plant (2) in KAZINCBARCIKA[7]

Map Ref:

25X1

Hungary 1:50,000

25X1



25X1

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex T

1. Plant area, a flat, rectangular shaped area about 550 x 600 m.

2. Railroad spur, European Standard gauge, not indicated on map.

3. Sajó River, not navigable. A dam was constructed between an unidentified island and the river bank to provide water for the power plant and the Kazincbarcika Chemical Combine.

4. Town limits of Sajószentpeter.

5. Asphalt road, about 300 m long and 4 m wide, in excellent condition. Constructed in 1953, it was not shown on the map.

6. Asphalt road, four meters wide, in good condition.

7. Dirt road, three meters wide, in poor condition.

8. Railroad line, single track, European Standard gauge, connecting MISKOLC with ÓZD.

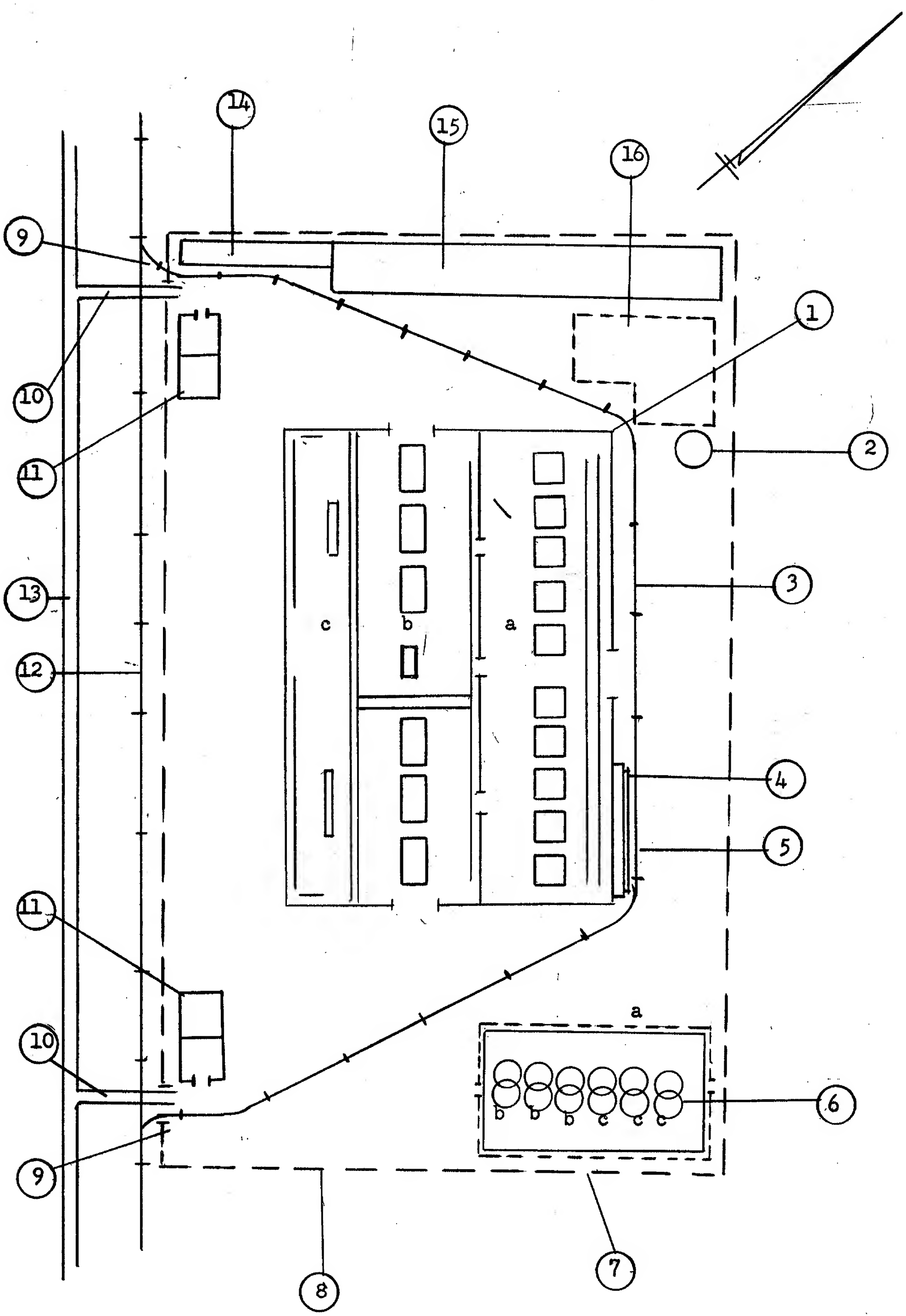
25X1

C-O-N-F-I-D-E-N-T-I-A-L

Annex T-1

[redacted] Sketch of the Borsod[7] Thermal Power Plant Layout

25X1



25X1

[redacted]

C-O-N-F-I-D-E-N-T-I-A-L

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex T-1

1. Power plant building, one story, reinforced concrete structure with steel frame skylights. It consisted of the three following buildings:

   a. Boiler house, about 400 x 120 x 10 m (sic), contained five boilers each 100 tph and 100 atm. These boilers were heated by pulverized coal burning furnaces; they began production on 1 January 1956. Five additional boilers of the same capacity were scheduled to be installed December 1957. Conveying equipment with attached coal pulverizers was also located here.

   b. Turbine house, about 400 x 120 x 10 m (sic), it contained three turbogenerators horizontally arranged, each of 30,000 kw capacity. They were completed and began production in January 1956; one turbogenerator horizonally arranged, of 20,000 kw capacity, it was completed and began production in March 1956; three turbogenerators each of 30,000 kw capacity were under construction and were to be completed on 1 December 1957; a bridge crane of 25 tons capacity, running on rails which were supported by five meter-high concrete poles. This crane was used during turbine generator repair.

   c. Control house, about 400 x 60 x 10 m (sic), it contained two switchboards located along the walls, each controlled three turbogenerators; two control desks controlling the electric output of the plant.

2. Brick smokestack, about 50 m high and 4 m in diameter at the base.

3. Single track railroad spur, European standard gauge.

4. Open coal storage area.

5. Crane, tower transporter on rails, of 20 to 25 tons capacity.

6. Transformer yard, about 200 x 100 m; it contained the following:

   a. Mesh wire fence, supported by concrete poles two meters high and four meters apart.

   b. Three transformers, each of 30,000 kw capacity, each containing 400 liters of oil. They were completed and began production in the middle of 1956.

   c. Three transformers, same as above. They were completed but were not put into operation until December 1957.

7. Gate, double wing steel door, about four meters wide, kept closed.

8. Mesh wire fence, supported by iron poles about two meters high.

9. Gates, double wing steel doors, each about eight meters wide.

10. Connecting roads.

11. Guard house, brick structure with a flat concrete roof, measuring about 8 x 5 x 4 m. It contained a guard room where two civilian and one AVH security guard checked all workers entering the plant. Visitors had to be in possession of a special permit issued by the Ministry of Mines and Power Plants. Vehicles and railroad cars were controlled at this point.

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex T-1 (Cont'd)

12. Single track railroad line, European standard gauge.

13. Road.

14. Fire guard building, one story, brick structure with a shed type roof; about 80 x 3 x 4 m. Twelve firemen were billeted here; the northeastern part of the building stored the fire-fighting equipment.

15. Administrative building, two story, brick building with a flat concrete roof, about 300 x 6 x 10 m (sic). The ground floor contained a storage room for spare parts of engines; the second floor contained administrative offices.

16. Open parking area, L-shaped, each wing was about 100 m long. About 25 to 30 Csepel-type trucks of 5 tons capacity and Skoda and Pobeda passenger cars parked here.

Annex T-2

Borsod Thermal Power Plant (2) in KAZINCBARCIKA[7]

1. History

The Borsod Thermal Power Plant was planned and constructed by ERBE. It was included in the first five-year-plan and approved by the Council of Ministers in January 1950. Construction started in May 1950 and was completed in July 1954. Installation of the first three of six 30,000 kw turbogenerators and one turbogenerator of 20,000 kw to supply the plant with power, was completed on 1 January 1956. The final installation of equipment was expected to be on 1 December 1957, when the plant would perform at full capacity of 180,000 kw. The plant was to be handed over to the Power Trust upon completion; it would supply electrical energy to the Number 1 High Capacity Power Grid. The plant site was chosen primarily to exploit the low calorie coal from the surrounding Borsod Coal Mines which would provide considerable saving to the Hungarian economy.

2. Generating Units

The plant was to contain six turbogenerators, each 30,000 kw and a seventh turbogenerator of 20,000 kw capacity which would supply electricity to the plant. The turbines operated under a double-flow back-pressure steam system with three pressure stages. The turbogenerators were manufactured by the Lang Machine Factory in BUDAPEST 13, Váci Ut; they were installed during the winter of 1955-1956.

3. Boilers

The plant was scheduled to have 10 boilers, each 100 (tph) capacity, 100 atm. Five of the boilers were completed and began production on 1 January 1956. The boilers supplied pressure to the turbines in three stages; in the first stage, under 100 atm; the second stage, under 80 atm; the third stage, under 60 atm. The boilers were manufactured by the Crane Factory (Daru Gyár) in BUDAPEST; they were installed in 1955. Each boiler had two feed pumps, one of which was always in reserve. Each boiler also had a calorific ventilator, circulating pumps, and a special coal pulverizer with a built-in coal scale. The pulverized coal was blown into each boiler; cinders were removed by automatic vacuum equipment.

4. Water Supply

Water for the boilers and coolers was obtained from the Sajó River. A dam built across the Sajó River also provided water for the Kazincbarcika Chemical Combine. As this was a back pressure system, circulating cooler equipment was used for the turbines. The water went through the following boiler feed stages:

- Ballast or gravel filter
- Lime softener
- Deironing (equipment received through Austria from England)
- Chemical softener
- Deacidizing equipment
- Chemical filter

5. Fuel

Fuel for the plant was supplied by the Borsod coal mines. The coal was of a 3,000 kcal/kg value, and was delivered in railroad cars from mines five or six kilometers from the plant. A cable system was planned from the coal mines to the power plant. 25X1

25X1

[redacted]

Annex T-2 (Cont'd)

25X1

[redacted] Residual oil (pakura) was used as a substitute fuel when necessary. The oil storage tanks were built underground. [redacted] 10 railroad cars of coal being unloaded at a time and estimated that 30 or 40 such cars could be unloaded in about two hours with the help of one crane. 25X1

6. Transformers

There were six step-up transformers; four were 30,000 kw and two 60,000 kw. All were 10/110 kw ratio and were located in an open area, and were uncovered. Three of the transformers, one 60,000 kw and two 30,000 kw, were in operation since the middle of 1956, while the other three were expected to be in operation in December 1957. The oil capacity of the 30,000 kw transformers was 400 liters and the capacity of the 60,000 kw was 800 liters. The transformers had core-type cooling radiators. These transformers were manufactured by the Ganz Electric Company and were completed in January 1956. The transformer switch houses were also located outdoors and were uncovered. Delta voltage connections were used.

7. Transmission

The high voltage transmission lines were part of the Number 1 High Capacity Grid. The lines were of aluminum, cross-section 60 mm. The lines were suspended on 16-meter-high steel towers and had 50-centimeter porcelain chain insulators.

8. Plant Installation and Equipment

The plant's equipment was provided and installed by the following companies: Ganz Shipyard, BUDAPEST VIII, Váci Street; boilers with accessories; Ganz Electric Plant, BUDAPEST II, Lövőház Ut 10, entire electrical installation and equipment; Lang Machine Factory, BUDAPEST XIII, Váci Ut, all turbogenerators with accessories such as ventilators, pumps, compressors and auxiliary machinery.

9. Labor Force

While the plant was under construction, the labor force numbered about 1,200. However, during the plant's normal operation, the number will be reduced to about 1,000. The employees included six chief engineers, six assistant engineers and about twenty-four foremen. About 300 of the employees were considered skilled workers; the remainder were administrative, clerical and manual laborers. The manager of the plant was [redacted] István ROMÁN, [redacted] First Chief Engineer was VARGA (fnu), [redacted] 25X1 25X1

10. Security

The plant was guarded in one shift by 10 members of the security forces, (Állam Védelmi Hatóság-AVH) who were armed with submachine guns. An identity card with photo was issued to each employee of the plant.

C-O-N-F-I-D-E-N-T-I-A-L

25X1

Annex U

Pinpoint Location of the Mátrá Thermal Power Plant (3)

Legend

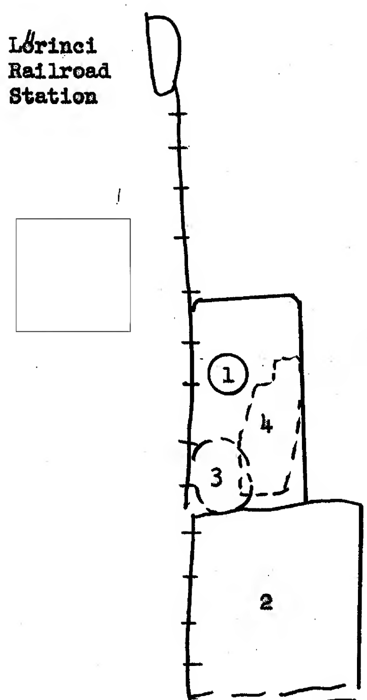
25X1

1. Power plant.
2. Worker's housing area.
3. Artificial lake for circulation/cooling of power plant equipment.
4. Swamp shown on map was eliminated according to source when the new Mátra power plant was constructed.

Map Ref:

Hungary 1:50,000

25X1



25X1

25X1

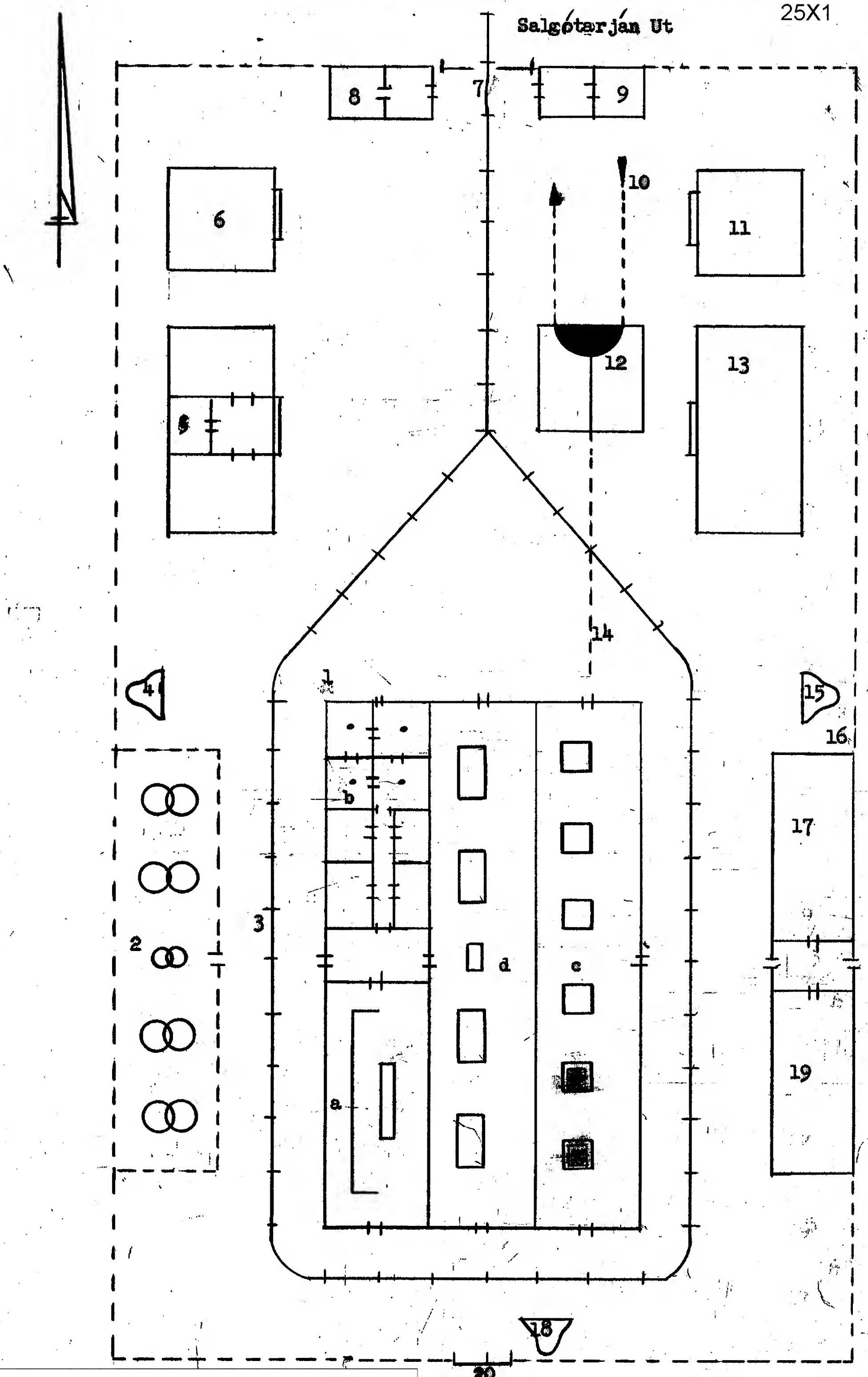
25X1

C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L

Annex U-1

Sketch of Mátra Thermal Electric Power Plant



C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex U-1

The Thermal Electric Power Station covered an area of 1,000 x 1,500 m; it was surrounded by a mesh wire fence, two m high. The plant entrance was 1 km from Salgótarjáni Ut.

1. Thermal power plant main building, 100 x 150 m, reinforced concrete, two story, flat concrete roof, three rows of square skylights operated by pushbuttons, large basement. The walls and floors were covered by white tile.

   a. Control house containing 16 control boards operated by one electrician; five of the control boards served five turbogenerators, all AEG German made, and five transformers. The other control boards served the carrier communications system. The control house also had a control table 1 x 5 m which was operated by one electrician.

   b. Eight offices occupied by the plant manager and his staff (plant maintenance offices were located in the basement).

   c. Turbogenerator house with a heavy overhead traveling crane (possibly 50 ton capacity). It had five turbines, including four 30,000 kw and one 15,000 kw; all were manufactured at the Lang Machine Factory, BUDAPEST 13, Vaci Ut.

   d. Boiler house containing six boilers, each 100 tph and 80 atm. They utilized pulverized ligite rated at 1500 kcal/kg. The boilers were manufactured by the Ganz Ship Plant, BUDAPEST. The basement contained turbogenerators, condensers, and condensor pumps; all were Lang Machine Factory manufactured. The water cooling circulation pumps, the air cooling system, coal and slag conveyors, and slag vacuum compressor were also stored in the basement.

2. Open transformer yard surrounded by a mesh wire fence. It contained four closed oil cooled, 30,000 kw transformer and one voltage regulator.

3. European standard gauge railroad, leading from Lőrinci railroad station to the plant. It was only used in emergency, when the coal conveyor was interrupted, and for passenger service for the workers of the plant.

4. Post continuously manned by AVH guards (one man per post). There were 32 AVH guards commanded by an AVH officer and assisted by a sergeant stationed at this power plant.

5. Warehouse, 10 x 20 m, one story brick, flat roof. It contained four rooms, two for storage of spare parts, two for various POL products.

6. Garage, 6 x 6 m, brick, flat roof, one pull-type door. It housed one Skoda and one Pobeda passenger car.

7. Main entrance, 8 m wide, including one for vehicles (automobile and railroad freight cars) and two pedestrian entrances. The main entrance for vehicle traffic was closed when not in use; the pedestrian entrances were always open.

8. Doorman and a guard relief-room, 4 x 8 m, brick, flat concrete roof. It contained a punch clock and several racks for the time cards.

C-O-N-F-I-D-E-N-T-I-A-L

25X1

Legend to Annex U-1 (Cont'd)

9. Fire station, same size and appearance as building item 8 above. Four firemen and chief continuously on duty. The station was equipped with several foam and sand fire extinguishers.

10. Overhead coal bucket conveyor, 16 m high. It led from the Petöfi coal mine to the plant (approximately 7 km) and took slag from the power plant to a cement plant 6 km away.

11. Truck garage, 10 x 10 x 6 m, one story high, brick, flat roof. It accommodated two Csepel three-ton trucks.

12. Coal and slag bunker, 10 x 10 x 16 m, reinforced concrete. An underground rubber conveyor belt (see item 14) transported the coal from the coal bunker to a pulverizing mill. Slag was removed by vacuum pumps through concrete pipes, 0.3 m in diameter, which led into the slag bunker. A bucket conveyor automatically dumped coal into the coal bunker, then continued to the slag bunker, picked up slag and conveyed it to the slag dump.

13. Machine repair shop, 10 x 20 m, one story, brick, flat roof. It contained several semi-automatic lathes, drill and milling machines and work benches. This repair shop was mainly used in the maintenance and service of the turbogenerators, boilers and auxiliary equipment.

14. Rubber conveyor belt, 0.8 m wide. It was used between the coal bunker and the coal pulverizing mill.

15. Guard post, same as item 4.

16. Entrance.

17. Pump house.

18. Guard post, same as item 4.

19. Water treating unit.

20. Entrance, 4 m wide, open only to vehicle traffic.

C-O-N-F-I-D-E-N-T-I-A-L

[redacted]

Annex U-2

Mátrá Thermal Power Plant (3)

25X1

1. **History of Plant**

This plant was constructed between 1941 and 1945 [redacted] 25X1 [redacted] As soon as the plant was completed, the Soviets confiscated the machinery, and dismantled and transported it as war booty to the USSR. The Hungarians secured a copy of the original blueprints of the plant, and as soon as a new Hungarian government was formed in 1946 the [redacted] blueprints were modified and the equipment was replaced. [redacted] 25X1 that the Mátrá plant was a good example of a thermal power plant using a low cost, low calorie fuel. All machines and equipment formerly of German origin were now produced by Hungarian firms. The boilers were enlarged from 60 to 80 tons of steam per hour. In 1949 it was completed and tested for one year. It had many breakdowns, especially with the 100 tph boilers, which threw back flames because of lack of air in the boiler house. [redacted] 25X1 [redacted] the boiler house size was too small and had too little air for the enlarged boilers. After the boiler house was enlarged by 40 percent there was enough air for the faultless boiler operation. When the difficulties were overcome, operation was resumed in May 1950 and the plant has operated since without breakdown. [redacted] 25X1

2. **Primary Function and Use**

The plant was a base load plant and was to produce 140,000 kw continuously.

3. **Installed Capacity**

The installed capacity of the plant was 135,000 kw.

4. **Generating Units**

The plant had five turbogenerators, four of 30,000 kw each and one of 15,000 kw plus another generator which supplied electricity for the plant.

5. **Boilers**

The plant had six boilers, each rated at 100 tph and 80 atm. Expensive breakdowns at this plant was caused by the poor quality (brittle) fire bricks used in the boilers up to 1953. After considerable futile attempts by the Kőbánya Ceramics Plant, BUDAPEST, (Kőbanyai Kerámia Gyar), fire resistant bricks were ordered [redacted] 25X1

C-O-N-F-I-D-E-N-T-I-A-L

25X1 [redacted]

Annex U-2 (Cont'd)

6. **Water Supply**

The plant had a separate water reservoir 1.5 x 3 km, depth unknown; it was fed by Salgó Stream. From the reservoir the water was pumped into the plant's cooling tower.

7. **Fuel**

The plant used 3,000 tons of 1,500 kcal/kg lignite during a 24 hour period. The lignite was delivered from the Petőfi Mines by overhead bucket conveyor system. Construction of an additonal overhead bucket conveyor system from the Gyöngyös lignite mines was started during 1956. The Gyöngyös mines produced lignite of 2,000 kcal/kg and was supposed to supplement this plant's fuel supply in an emergency. [redacted] the research engineer who had to decide on the prospective over-all quantity of lignite in the Petőfi mine had estimated it as sufficient for the operation of the plant for 25 years. BALOG, however, was sure that if 3,000 tons of lignite were supplied daily to the power plant from the Petőfi mine, it would be exhausted by 1965. 25X1

[redacted] 25X1

8. Transformers

The plant had four closed oil cooled 30,000 kw 10/110 kv transformers.

9. Transmission

Five high tension power lines passing through the plant, included two to the Népliget, Budapest transformer yard, two to the Diósgyőr transformer yard, and one to the Salgótarján power plant.

10. Auxiliary

[redacted] basement of the thermal power plant contained the following equipment: turbogenerator, condensers, and condenser pumps, the air cooling system, and various water cooling circulation pumps, (all of Lang Machine Plant, BUDAPEST origin), the boiler water feed pumps, the coal and slag conveyors, the coal pulverizer and pulverized coal injection compressor, and the slag vacuum compressor were also in the basement. The coal and slag compressors were of Lang Machine Plant origin. The electrically operated smoke ventilation apparatus was of unknown origin, the boiler air regulator was of Rutcka type of Czechoslovak origin. 25X1

11. Manpower

The plant employed approximately 600 persons, among them 10 to 15 females. [redacted]

 25X1

25X1

C-O-N-F-I-D-E-N-T-I-A-L

[redacted]

Annex U-2 (Cont'd)

There were altogether 24 permanent engineers including the plant manager (always referred to as chief engineer) and 12 apprentice engineers. Of the 23 senior engineers, seven were department supervisors, one for each department of the plant, two or three were employed at the planning department, while the remainder were assistant department chiefs. The 12 apprentice engineers were assigned to the plant for training purposes only. [redacted] this power plant was the only one which trained young engineers for the other plants in Hungary.

25X1 25X1

The seven departments employed (three shifts, seven days a week) the following workers:

Plant (Installation) Maintenance Department. This department was divided into three sections:

The boiler section employed 46 workers.
The turbogenerator section employed 16 workers.
The electric section employed 6 to 8 workers.
The Electrical (repair) Department employed 16.
The Transportation Department employed 150.
The Engineering (Planning) Department employed 3 technicians.
The Administration Department employed 20.
The Maintenance Department employed 150, among these there were firemen, guards, maintenance personnel, yard cleaning crew, plant locksmith, masons, and carpenters.
The Supply Department, which was subdivided into the following sections; material-machine spare parts; work clothing and supplies; office material; POL products; employed 80.

25X1 25X1

[redacted] by furnishing the aforementioned breakdown, [redacted] a theoretical attempt to show where the plant's employees were assigned. In reality it was very difficult to keep track of the workers since, most of the time, the majority of the workers were pooled for emergency repairs. Because overtime payment was prohibited, those who worked beyond an eight hour shift were reimbursed with compensatory time. [redacted] left the difficult task of scheduling employees to his department supervisors who in turn left it to their work masters. The work masters, actually divided their weekly labor force into four shifts. Three eight hour shifts and one shift to replace those workers on vacation, sick, or off on compensatory time. The administration, supply, and machine repair employees worked only one shift, six days weekly.

25X1

12. Miscellaneous

25X1 25X1 25X1 25X1 25X1

[redacted] three persons were burned to death and several severely injured when the reequipped plant was re-opened in 1952. [redacted] for a few weeks during 1952, Soviet power plant engineers, including the plant manager of the Moskva, largest electric plant, visited the Mátra power plant. [redacted] the original equipment of this plant, which was dismantled in 1945, was shipped to an industrial city (name unknown) in the Ural Mountains where it was left untouched in an open storage area because of the lack of skilled engineers capable of installing these machines in a power plant.

[redacted]

25X1

C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L

Annex V

[redacted] **Pinpoint Locations of the Kelenföld (4) and the Csepel (14) Thermal Power Plants**

25X1

Map Ref:

Hungary 1:50,000 [redacted]

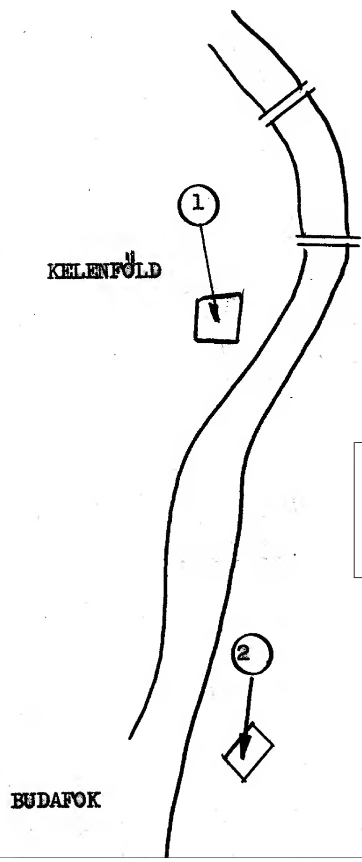
Legend

25X1

1. Kelenföld Thermal Electric Power Plant, officially referred to as Number Four Condenser Type Power Plant.

2. Csepel Thermal Electric Power Plant, officially referred to as Number 14 Exhaust Steam Plant.

25X1



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25X1

C-O-N-F-I-D-E-N-T-I-A-L

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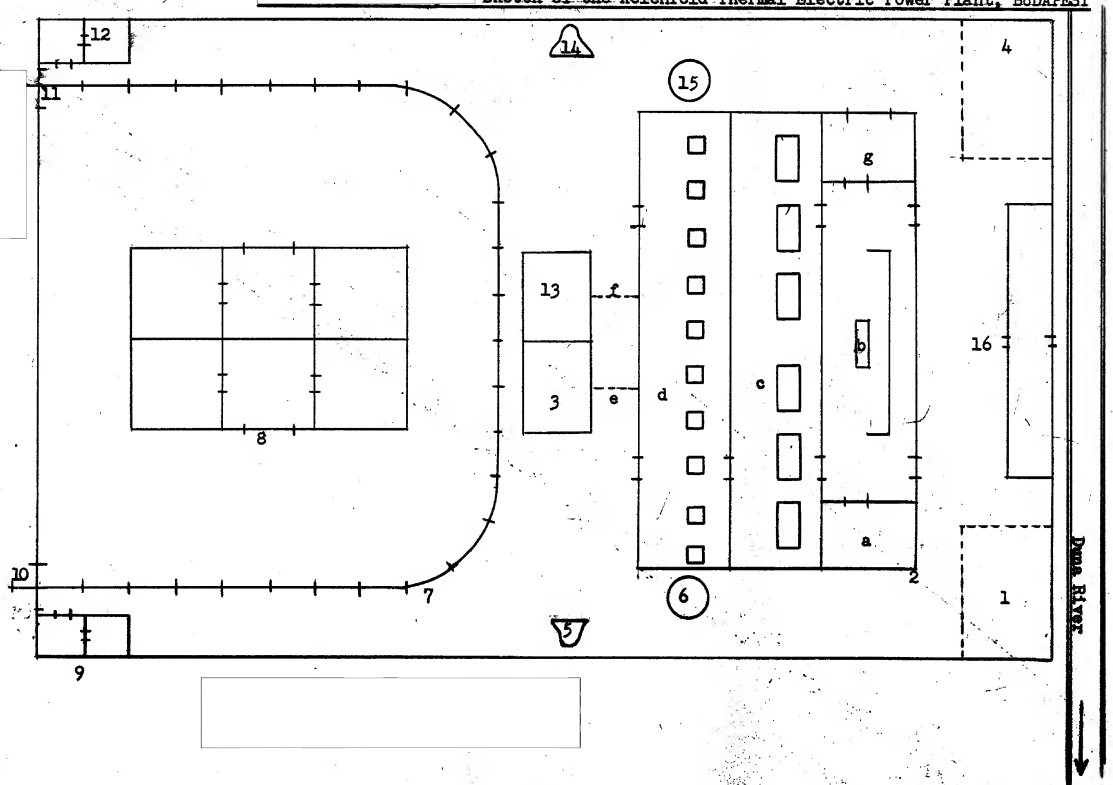
25X1

Annex V-1

Sketch of the Kelenföld Thermal Electric Power Plant, BUDAPEST

25X1



25X1

C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex V-1

The plant covered an area of approximately 800 x 1,200 m; it was surrounded by a stone wall 1.8 m high. The main entrance faced an unidentified side street of the Budafoki Ut.

1. Open transformer yard, surrounded by a mesh wire fence. Each contained six closed, oil cooled, 15,000 kw, 10/110 kv transformers. These transformers were of Ganz Electric Plant, BUDAPEST origin; they were installed in 1948.

2. Thermal power plant main building, 120 x 180 m, old type reinforced brick structure, with sheetmetal covered hangar type roof with skylights along its long side. It contained the following:

   a. Plant manager's office.

   b. Control house which contained several instrument boards with the carrier communication system built into their backs and a control table.

   c. Turbogenerator house with a heavy overhead traveling crane. It contained six turbogenerators of unidentified type and capacity; their total capacity was 95,000 kw.

   d. Boiler house containing 10 unidentified boilers, [illegible]; their total capacity was 160 tph.

   e. Underground coal metal conveyor from bunker to the pulverizing mill.

   f. Underground slag transport system.

   g. Machine repair shop. A concrete air raid shelter, constructed during WW II, was located approximately eight meters below this building. It had a capacity of 250 to 300 persons; it could accommodate one shift employed in the plant, including the control house personnel, who would operate a duplicate of the instrument table and control instrument board from this shelter. The underground control house also had a carrier system installed; it was located directly below the instrument table and instrument board of the control house. The Number 2 Grid (60 kv) and the greater BUDAPEST electric circuit could be controlled from here.

3. Coal bunker, coneshaped, with open top, 20 x 20 x 6 m (3 m below and 3 m above surface), reinforced concrete. Before coal was dumped into this bunker, each coal car passed over a weighing bridge.

4. Same as item 1 above.

5. Guard post.

6. Smoke stack, 45 m, brick, built on concrete base.

7. European standard gauge railroad net serving several plants. The freight trains were pulled by electric engines.

8. Office building, 14 x 20 m, two story, brick, with slate covered roof. The first floor was occupied by the plant manager and his staff; the second floor was used as apartments for the plant manager and his assistant.

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex V-1 (Cont'd)

9. Doorman's booth and guard house, 4 x 8 m, one story, brick, with flat concrete roof. The doorman's booth had an extended roof under which the time clock and punch-card racks were located. The guard house was used by the relief guards.

10. Electrically operated double pull type iron door for all incoming traffic (freight trains, vehicle and pedestrian traffic), 6 m wide, open during daytime. Officially known as door Number 1.

11. Entrance, same type and width as item 10, used only by outgoing freight trains. Officially known as Number 2 entrance.

12. Fire station, same size and appearance as building item 9 above.

13. Slag bunker, same size and appearance as coal bunker item 3 above, except that it was closed on top. Slag was transported to this bunker by belt conveyor. A movable rubber conveyor loaded slag from the bunker into a freight car.

14. Guard post.

15. Smoke stack, 45 m high, brick, built on concrete base.

16. Water pump house for circulating cooling, 6 x 20 x 8 m (4 m above and 4 m below surface), concrete, flat roof. Water from the Danube River was pumped via a German (1944) constructed water treating unit to the boilers; from the boilers the water was pumped into storage tanks or was allowed to flow back into the Danube River.

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Annex V-2

[redacted]

Kelenföld Thermal Power Plant (4)

1. History of Plant

This power plant was constructed by the municipal authorities of BUDAPEST at the end of the 19th century and was gradually enlarged as the city grew. In 1948 the plant was nationalized and incorporated into the Number 1 Grid. At the same time extensive innovations were made in the plant, including the replacing transformers of 10/35 with transformers of 10/110 kv ratio. A Czechoslovak coal and slag conveyor system was also installed. 25X1

The plant produced over its installed capacity and was still moderately efficient. [redacted] the plant would suffer a complete breakdown in the near future because of excessive use. When the Thermal Power Plant in TISZAPALKONYA is completed, this plant will convert to stand-by status mainly because of its excessive daily use of 1,200 tons of coal and long coal haulage.

2. Production Data

The average production rate of the plant has been 100,000 kw/hr since 1947. 25X1

3. Generating Units

The plant had six turbogenerators. [redacted]

4. Boilers

The plant had 10 boilers of mixed capacity and unidentified origin. There were always six or seven boilers in operation producing 160 tph, while the rest were either on reserve or serviced. [redacted] the average age of these boilers was 35 years. 25X1

25X1

5. Water Supply

Water from the Danube River was used for circulation cooling since there were no water coolers. From the Danube River the water was run through a water treating unit into turbogenerators or boilers and from there either into hot water reserve tanks or back into the Danube River.

6. Fuel

The plant used 1,200 tons of unknown calorie coal daily and had a permanent reserve of five days. Coal was furnished to the plant by the Coal Distribution Trust.

7. Transformers

The plant had six closed oil cooled transformers, each 15 kw, 10/110 kv; they were produced at the Ganz Electric Plant, BUDAPEST, and installed during 1948.

This plant had an air raid shelter from which during emergencies the Number 2 Grid (60 kv) and the greater Budapest city electric circuit could be controlled. This plant and the Népliget transformer yard were connected by an underground cable.

8. Transmission

One 110 kv high tension power line joined the Csepel Power Plant, 110 kv power line which led into the Népliget transformer yard.

9. Manpower

The plant employed approximately 760.

C-O-N-F-I-D-E-N-T-I-A-L

[redacted]

Annex W

[redacted] Pinpoint Location of the Ajka Thermal Power Plant (5)

25X1

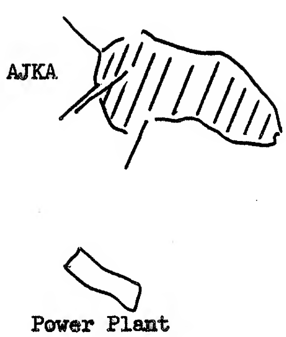
Map Ref:

Hungary 1:50,000

[redacted]

25X1

[redacted]



25X1

[redacted]

25X1

NOTE: This was condenser type plant.

25X1

[redacted]

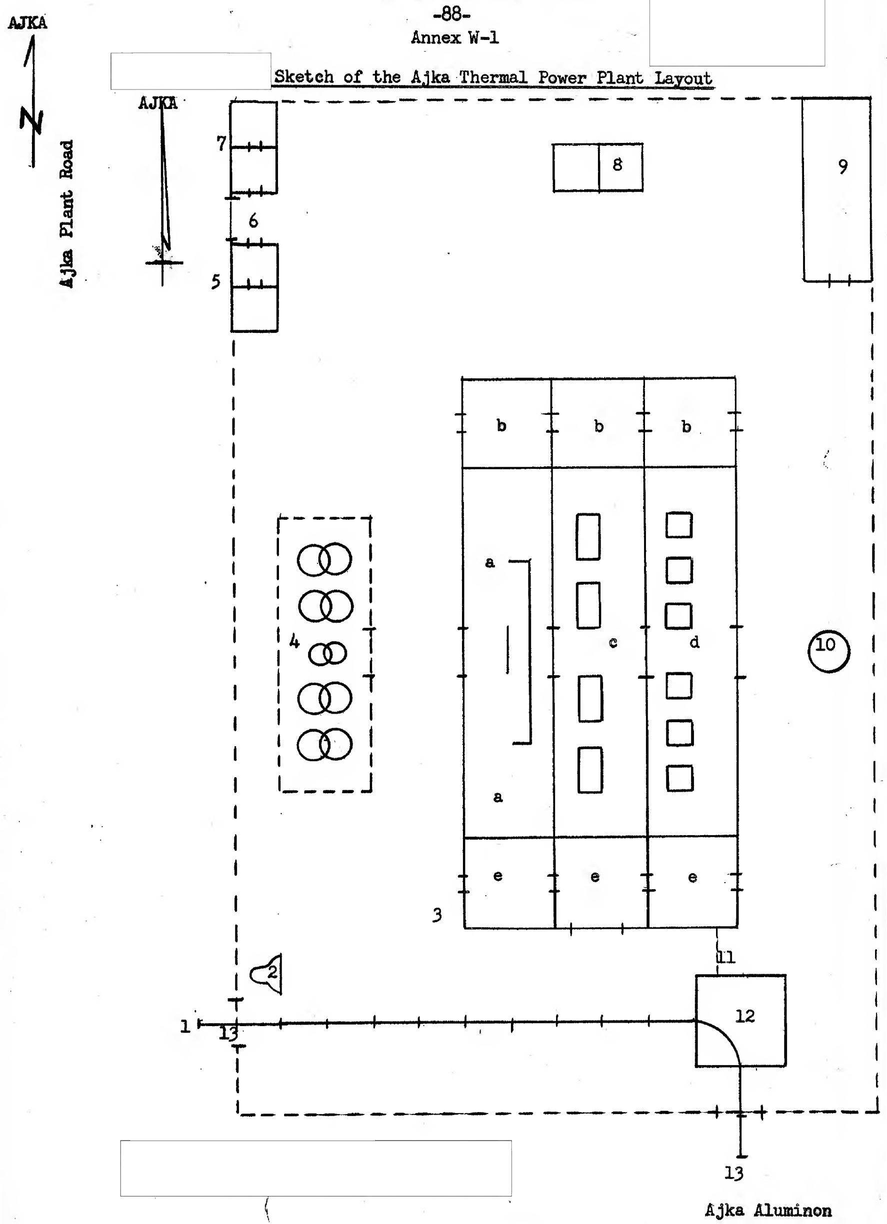
C-O-N-F-I-D-E-N-T-I-A-L

-88-

Annex W-1

25X1

Sketch of the Ajka Thermal Power Plant Layout



25X1

C-O-N-F-I-D-E-N-T-I-A-L

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex W-1

The thermal electric power plant covered an area of 800 x 1,00 m; it was surrounded by a mesh wire fence, 2 m high. The entrance of the plant was the Ajka highway.

1. European standard gauge single track rail line extending from the Ajka Railroad marshalling yard, through the power plant to the Ajka Aluminum Plant.

2. Guard Post

3. Thermal power plant main building, 150 x 200 m, two stories, reinforced concrete, with skylights. The building accommodated the following facilities:

    a. Control house containing a control board with carrier communication system.

    b. Three offices occupied by the plant manager and his staff.

    c. Turbogenerator house, with heavy overhead traveling crane (possibly 50 ton capacity) extending the length of the turbogenerator house, across the boiler shop and under the control house to the exits. It contained four turbogenerators, each 20,000 kw.

    d. Boiler house containing 6 boilers, each 30 tph and 80 atm; operated on 4,000 kcal/kg pulverized coal.

    e. Multi-purpose premises; the first floor contained machine repair shops; the second floor was occupied by the chief electrician and boiler offices.

4. Open transformer yard, surrounded by a mesh wire fence, 2 m high. It contained four 20,000 kw, 10/110 kv transformers and one voltage regulator.

5. Doorman and guard house, 4 x 8 m, brick, flat concrete roof. The guard house was used by the relief guard while waiting to go on duty.

6. Main entrance for vehicle and pedestrian traffic, 5 m wide including a 4 m wide double wing iron door and a 1 m wide single wing iron door for pedestrians. The entrances were always open.

7. Mess and canteen for plant employees. Same size and appearance as item 5 above.

8. Double cooling tower, 4 x 8 x 16 m. It served the turbogenerator. the tower had unidentified turbopumps of unknown capacity in its lower section.

9. Water treating unit and pump house, 4 x 16 x 4 m, brick, flat concrete roof. One half of the building contained the water treating unit; the other half housed six electric pumps (capacity unknown).

10. Smoke stack, 40 m high, brick, built on concrete base.

11. Underground metal coal conveyor belt, used for transporting coal from the coal bunker to the coal pulverizing mill.

12. Coal bunker, 8 x 8 x 8 m (4 m above and 4 m below surface) concrete, open top.

13. Railroad gates, closed when not in use. Guard at guard post kept the keys to these gates.

C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L

[redacted] 25X1

Annex W-2

Ajka Thermal Power Plant (5)

25X1

1. History of Plant

This plant was originally constructed in 1938 [redacted] It had an installed capacity of 60,000 kw. In 1953 this plant was enlarged to 80,000 kw according to plans by ERBE. The plant was furnishing its output to the Aluminum Plant in AJKA until 1947 when it was incorporated in the Number 1 Grid. [redacted] although the plant performed at peak efficiency, its production was more expensive than that of any other in Number 1 Grid, because its boilers had to be operated on 4,000 kcal/kg coal. 25X1

2. Generating Units

The plant had four turbogenerators, each 20,000 kw, 50 cycles per second. The turbogenerators were manufactured by AEG in Germany.

3. Boilers

25X1

The plant had six boilers, each 60 tph and 80 atm, and were operated on 4,000 kcal/kg pulverized coal. The boilers were manufactured [redacted]

4. Water Supply

Water for the plant was pumped from the Ajka aluminum plant's central water system into the power plant's water treating unit. The water-treating unit was equipped with six pumps of unknown capacity.

5. Fuel

The plant received 4,000 kcal/kg coal by railroad cars from the Ajka Csingervolgy Coal Mines. The coal was dumped into the plant's coal bunker, from the bunker the coal was transported on an underground metal conveyor belt to the coal pulverizing mill. The plant used 700 tons of coal during a 24 hour period.

6. Transformers

The plant had 4 closed, oil cooled 20,000 kw, 10/110 kv, 50 cycle, three phase transformers and one voltage regulator. The transformers were manufactured at the Ganz Electric Plant, BUDAPEST.

7. Transmission

A high tension (110 kv) power line entered the plant from the Népliget Sub-station. A high tension (110 kv) power line led from this plant and joined the Győr line.

8. Manpower

The plant employed approximately 650.

C-O-N-F-I-D-E-N-T-I-A-L

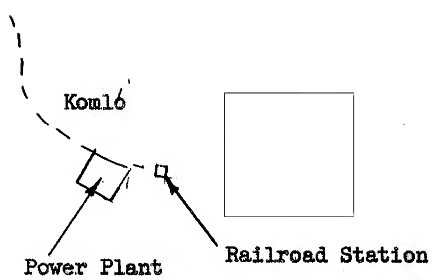
C-O-N-F-I-D-E-N-T-I-A-L

Annex X

Pinpoint of the Komló Thermal Power Plant (6)

Map Ref:

Hungary 1:50,000



NOTE: This was a condenser type power plant.

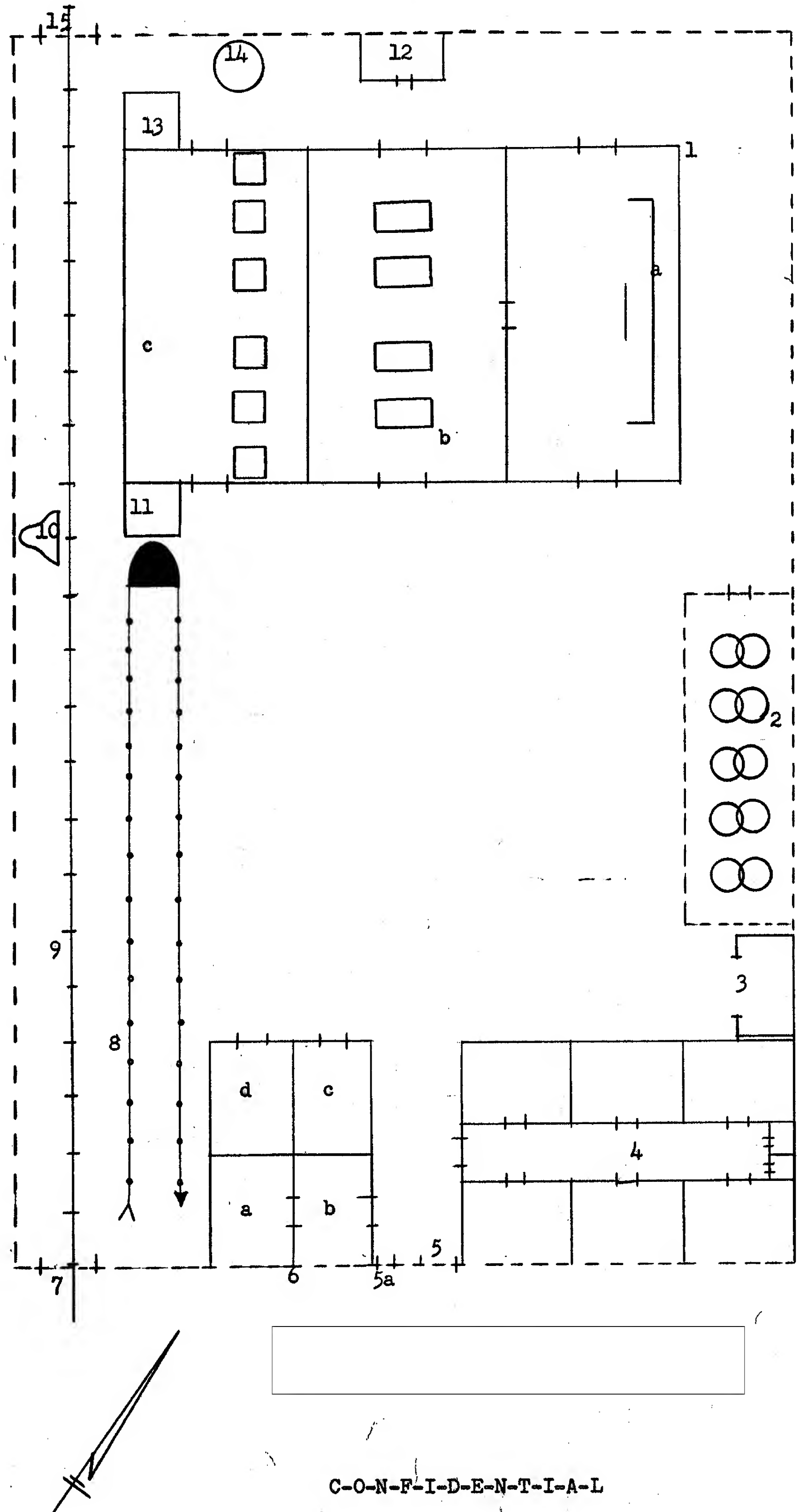
C-O-N-F-I-D-E-N-T-I-A-L

25X1

Annex X-1

Sketch of Komló Thermal Power Plant Layout

25X1



25X1

C-O-N-F-I-D-E-N-T-I-A-L

25X1

C-O-N-F-I-D-E-N-T-I-A-L

[redacted]

Legend to Annex X-1

The Kemlo Thermal Power Plant was completely reconstructed from 1950 to 1952 and all equipment described below was newly installed during that period. The plant covered an area of 1,000 x 1,500 m; it was surrounded by a 2 m high mesh wire fence, topped by several strands of barbed wire, and was supported by concrete poles 8 m apart.

1. Thermal power plant main building, 90 x 120 m, two story, reinforced concrete frame construction, brick walls, with a concrete flat roof, topped by a square steel frame skylight. Its basement contained most of the thermal power plant's auxiliary equipment including the condensers, water cooling pumps, feed reactors. The building housed the following facilities.

   a. Control house containing several instrument boards, which extended the entire length of the house. The carrier communication system was built in the back of the board. An instrument control table stood in the center of the control house.

   b. Turbogenerator house with a heavy overhead traveling crane (possibly 25 ton capacity). It contained four turbogenerators each 20,000 kw, manufactured at the Lang Machine Plant, BUDAPEST 13, Váci Ut.

   c. Boiler house containing 6 boilers, each 60 tph and 80 atm, operated by pulverized coal of 3,000 kcal/kg. Of the 6 boilers, 4 were in operation while 2 were serviced. They were manufactured at the Ganz Electric Machine Plant, BUDAPEST 8, Lövőház Utca 10.

2. Open transformer yard, surrounded by a mesh wire fence, 2 m high, supported by concrete poles. It contained four closed, oil cooled transformers each 20,000 kw, which transformed the electric power from 5 kv to 110 kv, and four towers, two for incoming and two for outgoing high tension power lines.

3. Brick garage, 10 x 20 m with two wooden double wing doors, flat concrete roof. It housed 1, 3-ton Csepel truck and a Skoda passenger car.

4. Administration building, 12 x 20 m, two-story, brick building with a flat concrete roof. The first floor was occupied by six officers, while the entire second floor was used as apartment for the chief engineer of the plant.

5. Main plant entrance, 4 m wide, double wing sheet metal doors, used by vehicle traffic. It was closed when not in use.

   a. Entrance for pedestrians, only plant employees and persons with special passes issued by the Ministry of Mines and Power Plants or by the plant's chief engineer were permitted to enter the premises.

6. Multi-purpose building, 8 x 12 m, brick, flat concrete roof.

   a. Doorman's room.

   b. Guard room.

   c. Storage room which contained all spare parts needed by the plant.

   d. Machine repair shop which contained one lathe, one drill machine, one milling machine, and two work benches, all used for repair of equipment used in the plant.

C-O-N-F-I-D-E-N-T-I-A-L

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex X-1 (Cont'd)

7. Railroad gates. Size and appearance was the same as entrance for vehicle traffic item 5 above. The keys to the gate which was closed when not used, were kept by the guard posted at the guard post item 10 below.

8. Overhead coal conveyor, bucket type, supported by 12 m high iron poles and extending for 3 km from the Komló Coal Mines to the plant.

9. European standard gauge single track railroad line connecting the Komló Coal Mines via this power plant with a slag pile. The line was used to transport slag and for coal only when the bucket conveyor was out of order.

10. Guard post, covered by a sheet metal roof. One guard was continuously posted at this post.

11. Coal bunker, approximately 12 m high (other measurements unrecalled) concrete reinforced, open top. Capacity was 20 railroad car loads, which was approximately six hours supply for operating the plant's coal pulverizer.

12. Pump house containing four pumps, each had a capacity of 4,000 liters per minute. The pumps were operated by one steam operated turbine; two electrically operated turbines were kept in reserve. Water for the plant was provided by the mine's ground water, which was collected in a open concrete lined reservoir.

13. Slag bunker, 12 m high, concrete structure, open on top and built with a pull down type sheet metal chute used to load slag directly into open freight cars.

14. Smoke stack, 40 to 45 m high, brick, built on a concrete base.

15. Same as item 7 above.

C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L

Annex X-2

Komló Thermal Power Plant (6)

1. History of Plant

The Komló Thermal Power Plant was constructed in 1934 or 1936. It was enlarged by ERBE during 1950-1952. [redacted] considered this plant as very efficient. There were no extension or improvements of any type considered for this plant. 25X1

2. Generating Units

The plant had four Ganz turbogenerators, each rated at 20,000 kw generating electricity at 5,000 volts.

3. Boilers

The plant had six boilers, 60 tph and 80 atm. Slag was removed by vacuum pumps. Only four of the six boilers were in operation while two were being serviced. Pakura oil, a derivative of crude oil, was used to start the boilers; then they were fed pulverized coal. The boilers were manufactured by the Ganz Machine Plant, BUDAPEST. There were four circulation pumps, which had a capacity of 1,000 liters per minute. These pumps were operated by one steam operated turbine (unknown hp) while two electrically operated turbines were kept in reserve.

4. Water Supply

Utility water for the plant was provided by mine ground water which was collected in an open concrete lined reservoir, 1,000 x 1,000 m. By opening a sluice at the bottom of the reservoir the water flowed through an underground pipeline to the pump house.

5. Fuel

All fuel for the plant which consisted of 3,000 kcal/kg coal waste which was furnished by the Komló Coal Mine.

6. Transformers

The plant had four closed transformers, each 20,000 kw, oil cooled, with voltage ratio of 5/110 kv.

7. Transmission

Current was 50 cycle, three phase and transmitted at 110 kv. All lines had insulators with approximately seven sheds, each 50 cm long, mounted on steel towers 50 to 100 m apart depending on the terrain.

C-O-N-F-I-D-E-N-T-I-A-L

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Annex Y

[redacted] **Pinpoint Location of the Inota Thermal Power Plant** (7) 25X1

Legend:

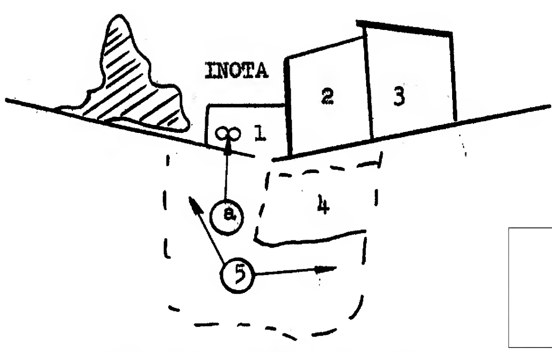
1. Inota Thermal Electric Power Plant.
a. Two cooling towers.
2. Soviet Aluminum Combine.
3. Worker's housing area constructed in forest.
4. Hungarian Penal Compound.
5. Coal mines.

Map Ref:

Hungary 1:50,000 [redacted]

25X1

25X1



25X1

NOTE: This plant was also referred to as "April 7".
This was a condenser type power plant.

25X1

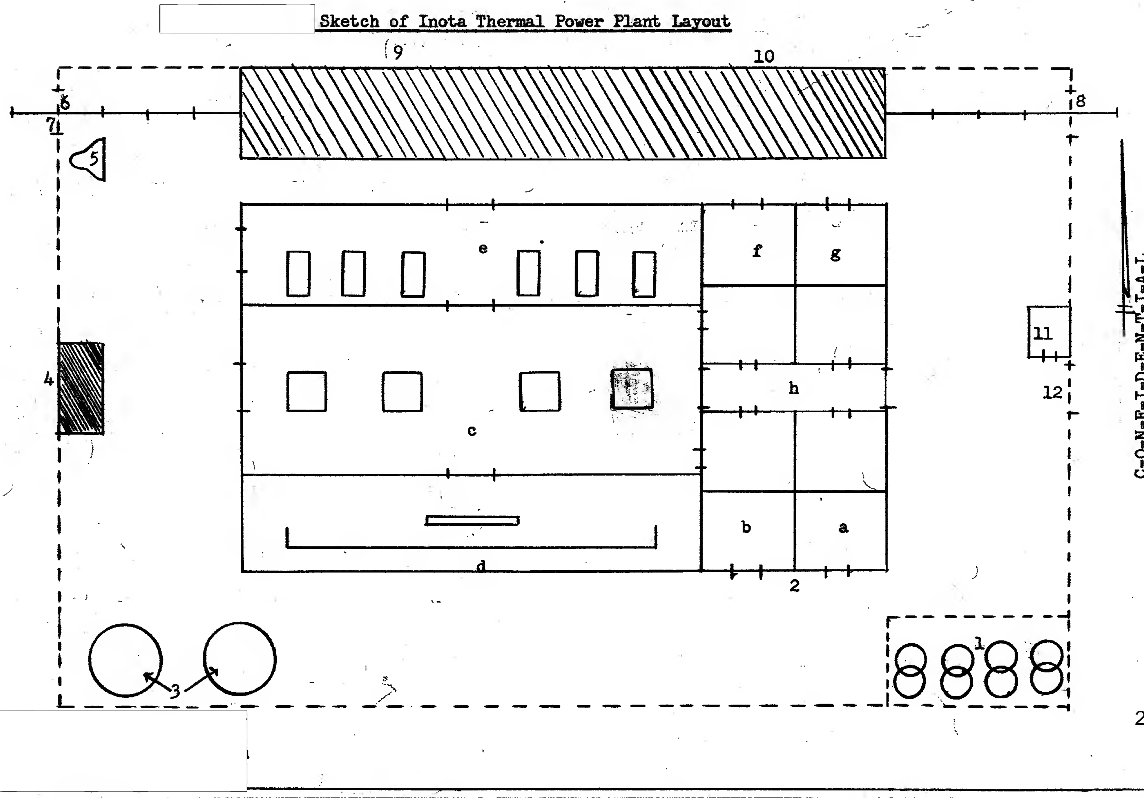
C-O-N-F-I-D-E-N-T-I-A-L

25X1

Annex Y-1

Sketch of Inota Thermal Power Plant Layout

25X1



C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L

25X1

[redacted]

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex Y-1

Inota Thermal Power Plant, condenser type, also known as "April 7" Power Plant. This plant was constructed between 1949 and March 1953. The plant covered an area of 800 x 1,200 m; it was surrounded by a mesh wire fence, 2 m high. The main entrance, jointly used by the plant and the Soviet Aluminum Combine, led to the BUDAPEST - GRAZ (Austria) highway.

1. Open transformer yard surrounded by a mesh wire fence, 2 m high. It contained four closed, oil cooled transformers, each 20,000 kw.

2. Thermal power plant main building 110 x 140 m, prefabricated reinforced concrete, two story, flat concrete roof with square skylight. Three smoke stacks, each approximately 1.5 m in diameter by 6 m high, sheet metal, protruded from the roof above the boiler house. The building contained the following facilities:

   a. Plant spare part storage.

   b. Laboratory.

   c. Turbogenerator house, with a heavy overhead traveling crane (possibly 50 ton capacity). It contained four turbogenerators, 20,000 kw each.

   d. Control house containing an instrument board and a control table. The carrier communications system was built into the instrument board.

   e. Boiler house with six boilers, each 30 tph at 80 atm, pulverized 2,000 kcal/kg coal operated.

   f. Water treating unit and unidentified pumps which fed water to boilers.

   g. Plant machine shop.

   h. Four offices, occupied by the plant manager and his staff.

3. Two cooling towers, each 4 m in diameter x 16 m high, concrete, open top; each cooled two turbines.

4. Water tank, 4 x 6 x 18 m, reinforced concrete structure, underground pipes carried ground water from the Várpalota coal mines, which were approximately 600 m from the plant. The water tank was for joint use by the power plant and the Soviet Aluminum Combine.

5. Guard post.

6. European gauge single track railroad line, leading from the Várpalota Railroad Station to the coal mine and from there to the power plant and to the Soviet Aluminum Combine. [redacted] the coal unloading procedure was complicated in this plant, because usually twice daily, a freight train with coal for the power plant and the Soviet Aluminum Combine passed through the power plant, then the section of the freight train for the plant was returned to the plant for unloading.

7 and 8. Two railroad gates, each 4 m wide, double wing iron doors. Opened only when in use. Key to gates were kept by the guard who opened the gates when he heard the whistle of the steam engine transporting the freight train and closed it when trains had passed the gate.

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex Y-1 (Cont'd)

9 and 10. Two bunkers of reinforced concrete, total length 140 m [illegible] x 10 x 10 m (4 m below the ground), topped by railroad tracks with a 6 m high slag bunker built over the tracks. The tracks passed over a weighing bridge and then entered between the coal and slag bunkers; the coal was dumped into the coal bunker then the car was filled with slag from the upper bunker. The slag bunker was filled by vacuum system connected to the boiler furnaces.

11. Doorman's house, 5 x 5 x 3 m, brick, flat roof.

12. Entrance for vehicle and pedestrian traffic, double wing iron door, 5 m wide. This entrance was always open.

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Annex Y-2

Inota Thermal Power Plant (7)

1. History of Plant

This power plant was constructed by the ERBE at Czechoslovak expense and equipped with Czechoslovak machines, except for Hungarian transformers, between 1949 and 1952. Of the plant's output which was 80,000 kw, 60,000 kw was to be furnished to Czechoslovakia for 25 years, while the remaining 20,000 kw was delivered to the Soviet Aluminum Combine, located immediately adjacent to the plant on the east. [redacted] the Hungarian people were told that the plant was constructed at Czechoslovak expense with Czechoslovak machines, but the government made a deep secret of the fact that none of the 80,000 kw production was to be used by the Hungarians and that the plant was Czechoslovak property. [redacted] the Soviets did not pay for the 20,000 kw of power furnished them. [redacted] the plant had an ill-fated start since the responsible Czechoslovak engineers in charge of the plant operation, which was staffed with Czechoslovak and Hungarian technicians, were forced by mutual agreement of the Czechoslovak and Hungarian Government to start operation without automatic equipment (electrical and mechanical types). Subsequently two Czechoslovak technicians were killed by a short circuit and two (new) turbogenerators were blown to bits, delaying the beginning of operations of this plant by six months. The Czechoslovaks constructed the two turbogenerators (which they had allegedly under construction for another unknown plant), the automatic equipment was also installed. All aforementioned events were kept secret from the public. A joint Czechoslovak and Hungarian investigation was undertaken in order to fix the guilt for the 50 million forint damage caused by the destruction of the two turbogenerators. The Czechoslovak Government blamed the Hungarian technicians employed in the plant, while a Hungarian expert commission, [redacted] proved after an exhaustive and conclusive investigation that the same commission had submitted a written expert opinion to the Hungarian Ministry of Mines and Power (Electric), which was later overruled, that it was impossible in the interest of safeguarding property and lives to start high pressure boilers and large turbogenerators without automatic equipment. It was explained that Czechoslovak engineers were, at the time of the accident, in charge of the plant, and in expert opinion, that it was impossible to supervise approximately 25 technicians (who were supposed to replace the automatic machinery until its installation in the turbogenerator house) sufficiently to have the coordination needed to overcome an unforeseen emergency within minutes. [redacted] after the plant was finally put in operation under Hungarian management at the beginning of 1954, and approximately 20 engineering shortcomings were overcome (including faulty construction of steam valves, faulty construction of coal bucket conveyor belt which broke slag carrying pipes), the boilers and the pipes leading to boilers began to leak and the automatic turbogenerator oil feed broke down. [redacted] after all these shortcomings were overcome, the ERBE and the Hungarian commission [redacted] submitted a report to the Ministry of Mines and Power (Electric) in which they pointed out in detail all shortcomings which had occurred, and generally blamed poor Czechoslovak planning and materials used throughout the plant. Furthermore, that the blueprints submitted to the ERBE by the Czechoslovak Ministry of Mines and Power were inadequate and had to be completely reworked prior to construction of the plant buildings. However, Czechoslovak engineers, who were in charge of the operation from 1952 to the beginning of 1954 were found competent, well trained for the position, but had to work under constant pressure from their Ministry. A copy of above findings were forwarded to the Czechoslovak Ministry of Mines and Power. No improvements and extensions for the plant were contemplated except for the construction of an overhead bucket conveyor system.

25X1 25X1 25X1 25X1 25X1 25X1 25X1 25X1

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex Y-2 (Cont'd)

[redacted]

2. **Generating Units**

The plant had four turbogenerators, each 20,000 kw, 50 cycles per second. The turbines were manufactured at the Czechoslovak Skoda Works; the generators were of unknown Czechoslovak manufacture.

3. **Boilers**

The plant had six boilers, each 30 tph at 80 atm, injected pulverized coal operated.

4. **Water Supply**

Ground water from the Várpalota coal mines, a distance of 600 m, was pumped into the plant water tank. This water tank was used jointly by the power plant and the Soviet Aluminum Combine.

5. **Fuel**

The plant consumed 900 tons of 2,000 kcal/kg coal during a 24 hour period. A reserve of 1,350 tons of coal, enough for 36 hours' operation was maintained. Source learned from the Varpalota Mine manager that according to his estimate, the coal supply in these mines would last 15 years.

6. **Transformers**

The plant had four closed oil cooled transformers, each 20,000 kw, of Ganz Electric Plant, BUDAPEST.

7. **Transmission**

A high tension power line led from the plant to KOMAROM across the Danube River to Czechoslovakia.

8. **Manpower**

The plant employed 750 persons.

25X1

9. **Miscellaneous**

25X1

[redacted] the Soviet Aluminum Combine, which was located immediately east adjacent to this power plant, was constructed between 1949 and 1952 and assumed operation in fall 1952 or spring 1953. It consisted of a large number of long reinforced brick buildings with sawtooth roofs extending from west to east. The Soviet Aluminum Combine was under Soviet management [redacted] It was heavily guarded by Soviet soldiers, branch and insignia unrecalled, who were armed with unidentified sub-machine guns. The plant employed mainly Hungarian penal laborers, from a Hungarian Penal compound 150 m south of the Combine and the power plant. Source had no further information, except that he heard that the Combine was the second largest aluminum producer in Hungary. No further information on labor, management or production.

25X1

C-O-N-F-I-D-E-N-T-I-A-L

-102-

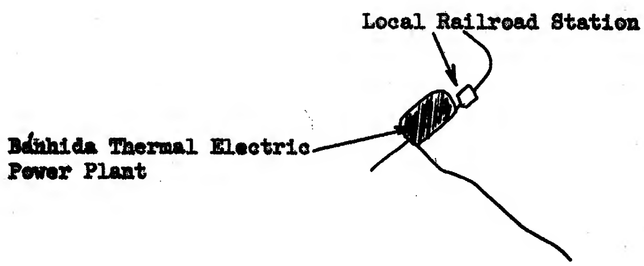
Annex Z

[redacted] 25X1

[redacted] **Pinpoint Location of the Bánhida Thermal Power Plant (8)**

25X1

[redacted] 25X1



[redacted] 25X1

Map Ref:

[redacted] 25X1

C-O-N-F-I-D-E-N-T-I-A-L

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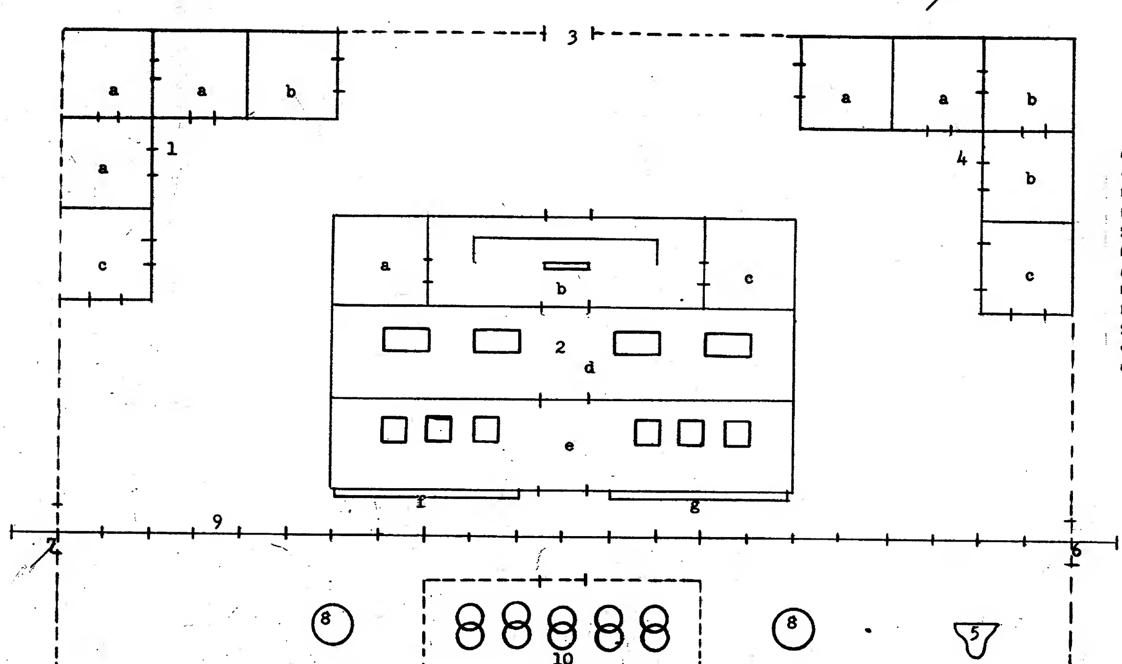
Annex Z-1

25X1

Sktech of the Bánhida Thermal Power Plant Layout

25X1



C-O-N-F-I-D-E-N-T-I-A-L

25X1

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C-O-N-F-I-D-E-N-T-I-A-L

[redacted]

Legend to Annex Z-1

The Bánhida Thermal Power Plant was constructed between 1928 and 1932 [redacted] Its maximum operational duration was 25 years. The thermal electric power station covered an area 800 x 1,200 m; it was surrounded by a barbed wire topped mesh fence two meters high, supported by concrete poles six meters apart.

1. Multi-purpose building, angle-shaped, each side 4 x 12 m, one story, brick, flat concrete roof. It contained the following:

   a. Technical management offices.

   b. Doorman's booth.

   c. Garage.

2. Thermal power plant main building, 90 x 140 m, two story, brick, steel reinforced frame, concrete flat roof from which three sheet metal chimneys, each 1.6 m in diameter x 6 m high, ventilation-type, protruded. (Two boilers had one chimney.) The interior walls of the turbogenerator and control houses were covered with marble. It accommodated the following:

   a. Carrier room.

   b. Control house containing an instrument board and a control table. The engineer in charge of the control table was able to observe the turbogenerators through the windows.

   c. Garage with open front. The plant's truck and passenger car were garaged here.

   d. Turbogenerator house with a heavy overhead traveling crane, and four turbogenerators each of 15,000 kw [redacted]

   e. Boiler house, containing six boilers, each 30 tph at 80 atm, pulverized coal operated.

   f. Coal bunker, 2.5 x 12 x 3 m, partly underground, concrete, open top. Coal dump cars were emptied into the bunker; a bucket conveyor transported the coal from the bunker, via a coal scale to an electrically operated coal pulverizing mill.

   g. Slag bunker same size and appearance as coal bunker; bucket conveyors filled the emptied coal dump cars with slag. [illegible]

The basement of the building contained auxiliary equipment of the turbogenerators and boilers, which included water and air coolers, turbogenerator condensors and feeder reactors and cable vaults.

3. Main entrance double wing iron door, 5 m wide used by all vehicles and pedestrian traffic.

4. Multi-purpose building; same size and appearance as building item 1 above. It contained the following facilities:

   a. Fire station with a foam extinguisher mounted on two wheels, and several buckets of sand.

   b. Machine repair shop with one lathe, one milling and one drilling machine and two or three work benches.

C-O-N-F-I-D-E-N-T-I-A-L

25X1

Legend to Annex Z-1 (Cont'd)

5. Guard post, covered by a sheet metal roof. The guard on duty opened and closed the railroad gates.

6. and 7. Railroad gates, each four meters wide with double wing iron door. They were closed when not in use.

8. Two concrete cooling towers, each approximately 4 m in diameter and 16 m high, concrete roof. Water from an open reservoir located at an unidentified stream in the vicinity of the plant furnished water via underground pipes to the cooling towers.

9. European gauge single track rail line connecting the Bánhida Railroad Station with plant. The coal cars arriving from various coal mines in the vicinity were assembled at the station for routing to the plant.

10. Open transformer yard surrounded by a mesh wire fence. It contained four closed, oil cooled, 400 liter capacity transformers of 15,000 kw each, one voltage regulator, and two towers, one carrying incoming and one carrying outgoing high tension power lines.

25X1

C-O-N-F-I-D-E-N-T-I-A-L

[redacted]

Annex Z-2

Bánhida Thermal Electric Plant

25X1

1. History of Plant

The Bánhida Thermal Power Plant was constructed between 1928 and 1932 [redacted] 25X1 Its assumed maximum operation was 25 years. The plant was only moderately efficient [redacted] 25X1 it was planned to put this plant on stand-by basis as soon as the Tiszpalkonya Thermal Power Plant was completed. It was planned to make a general repair of the plant as soon as it was put on stand-by basis. No additional equipment of any type was to be installed.

2. Generating Units

The plant had four turbogenerators of the condenser type, each 15,000 kw, three phase, 50 cycles per second. [redacted] 25X1

3. Boiler

The plant had six boilers, each of 30 tph at 80 atm. [redacted] 25X1 For operation of the boilers, 3,000 kcal/kg pulverized coal was injected. Four of the six boilers were in operation while two were serviced. 25X1

4. Water Supply

The boiler water supply was from an open reservoir located by an unidentified stream in the vicinity of the plant; the water flowed through underground pipes into two concrete water towers at the plant. [redacted] each tower cooled two boilers. No information on the type or capacity of water pumps used or whether the water was treated prior to use. 25X1

5. Fuel

The main source of the fuel for this plant was delivered in railroad cars from the Alsógalla and Felsógalla coal mines. [redacted] the plant used 70,000 kg of coal during a 24 hour period. A reserve for five to six days was stored in piles on the east of the railroad track in the plant area. 25X1

6. Transformers

It had four closed, oil cooled, 15,000 kw transformers, 10/110 kv. In 1948, the transformer station was enlarged.

7. Transmission

One line carrying three phase, 50 cycle transmitted at 110 kv fed directly into Number 1 Grid.

8. Manpower and Guard

25X1

[redacted] the plant employed 560 persons, mostly male, a few female office workers. The plant operated in three shifts daily. The parts room operated one shift, six days 0700 to 0500 hours (no Sundays). The entrance for vehicles and pedestrians was guarded by one unarmed doorman per shift (7 days weekly). Fifteen firemen, including three chief firemen were on duty in alternating shifts (4 firemen and 1 chief per shift) around the clock. Fifteen plant guards, armed with rifles, were on duty (5 guards per shift) around the clock.

C-O-N-F-I-D-E-N-T-I-A-L

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Annex AA

[redacted]

Pinpoint Location of Dorog Thermal Electric Power Plant (9)

Map Ref:

Hungary 1:50,000

[redacted]

25X1

25X1

[redacted]

25X1

[redacted]

[redacted]

25X1

C-O-N-F-I-D-E-N-T-I-A-L

[redacted]

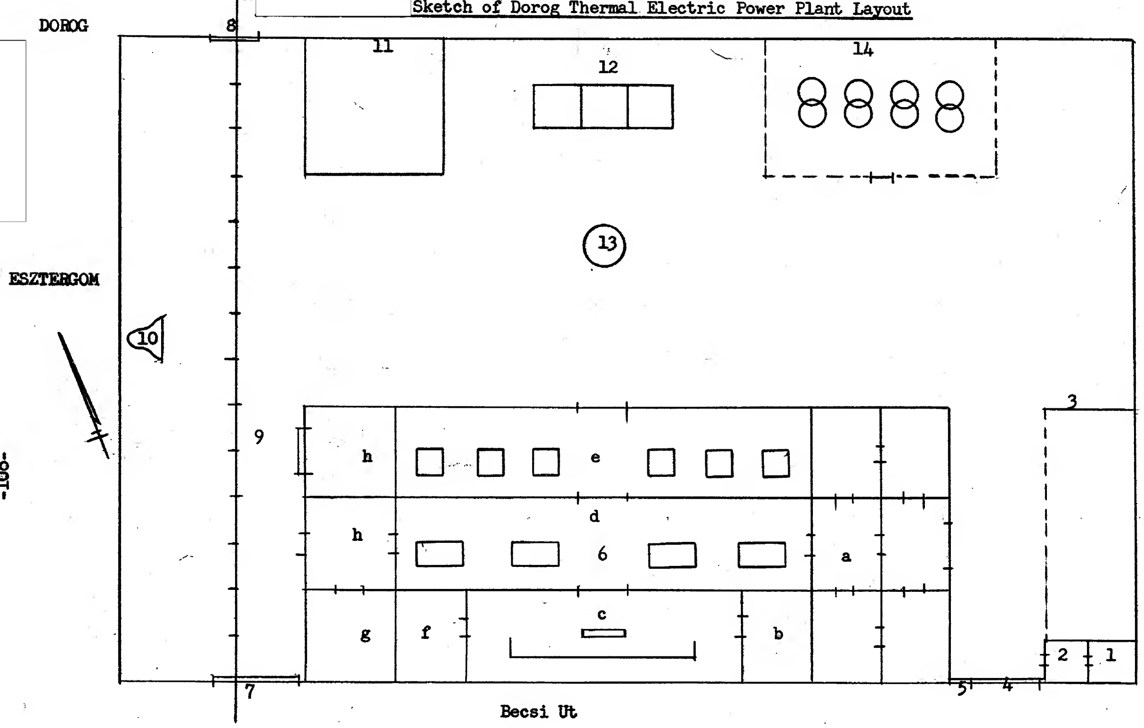
Annex AA-1

25X1

Sketch of Dorog Thermal Electric Power Plant Layout

25X1

[redacted]



C-O-N-F-I-D-E-N-T-I-A-L

-108-

C-O-N-F-I-D-E-N-T-I-A-L

[redacted]

25X1

25X1

[redacted]

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex AA-1

The Doreg Thermal Power Plant was constructed at the turn of the century and gradually improved until 1947, when it was incorporated into the Number 1 Grid. [redacted] 25X1
This power plant covered an area of 800 x 1,000 m; it was surrounded by a brick wall 1.8 m high, on three sides, on the fourth side, facing Becsi Ut, it was walled off by the front of the power plant's main building.

1. Guard relief building, approximately 4 x 4 x 3 m, brick, flat roof. It was used by one man.

2. Entrance to doorman's building, same as item 1 above.

3. Auto shed, approximately 4 x 16 m, with flat concrete roof, open on the west side. It garaged one truck, one passenger car and one motorcycle.

4. Main vehicle gate, 4 m wide double wing iron door, closed when not in use.

5. Pedestrian entrance, 1.2 m wide, single iron wing door, usually open only at the time of shift change.

6. Thermal power plant main building, 160 x 100 m, brick reinforced with steel beams especially for the overhead crane, slate shingle gabled roof, two story. The basement contained the plant's water treating unit. The building accommodated the following:

   a. Six office rooms occupied by the technical staff of the plant.

   b. Carrier room.

   c. Control house with an instrument board and control table.

   d. Turbogenerator house with a heavy overhead traveling crane. It contained four turbogenerators, each 15,000 kw. [redacted] 25X1 the turbogenerators were 30 years old.

   e. Boiler house with six boilers, each 30 tph at 80 atm, pulverized coal operated. [redacted] they were at least 30 years old [redacted] 25X1

   f. Duty engineer's office.

   g. Parts room.

   h. Plant's repair shop with one lathe, one milling and one drilling machine, and two work benches.

7. and 8. Iron double wing entrance gates, each four meters wide, closed when not in use. The keys to these gates were kept by the plant guard posted at item 10 below.

9. European standard gauge single track rail spur branching off a rail line which also served a local carbide plant and brick kiln.

10. Guard post covered by sheet metal roof. The plant's only guard; he held the keys to the gates items 7 and 8 above.

C-O-N-F-I-D-E-N-T-I-A-L

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Legend to Annex AA-1 (Cont'd)

11. Watertower, 8 x 8 x 16 m, reinforced concrete. Lower part of water tower contained unidentified electrically operated pumps which pumped water via a water treating unit located in the basement of the thermal power plant main building to the cooling towers item 12 below.

12. Cooling tower, 4 x 12 x 16 m, of pine wood with a flat sheet metal roof. The cooling tower was divided into three sections, each serving two boilers.

13. Smoke stack, approximately 40 m high, built on concrete base.

14. Open transformer yard, surrounded by a mesh wire fence, 1.8 m high. It contained four closed oil cooled Ganz, 15,000 kw transformers and all the auxiliary equipment.

25X1

C-O-N-F-I-D-E-N-T-I-A-L

[redacted]

Annex AA-2

Dorog Thermal Power Plant

1. History

This power plant was constructed at the turn of the century to provide electric power to the Dorog Coal Mines. As the coal mines enlarged their operation they also improved the equipment of the plant and added various types of [redacted] manufactured machines. [redacted] No improvements were contemplated for this plant. 25X1

2. Generating Units

The plant had four turbogenerators, each 15,000 kw, three phase, 50 cycles. [redacted] 25X1

3. Boilers

The plant had six boilers, each of 30 tph at 80 atm, 3,000 kcal/kg pulverized coal operated. [redacted] they were at least 30 years old [redacted] Four of the six boilers were in operation while two were serviced. 25X1

4. Water Supply

Ground water from the Dorog coal mines was pumped into the plant's water tower and from there through a water treating unit for unidentified chemical treatment before it was used for cooling purposes. [redacted] 25X1

5. Fuel

The plant's coal was delivered by freight cars from the Dorog coal mines. [redacted] approximately 70,000 kg of coal was consumed during a 24 hour period. A reserve of 350 to 420 tons of coal was kept in the plant's yard. 25X1

6. Transformers

The plant had four 15,000 kw, closed oil cooled transformers, 10/110 kv. They were manufactured by the Ganz Electric Plant.

7. Transmission

One 110 kv, three phase, 50 cycle line ran from the plant via the Győr high tension line into the Number 1 Grid.

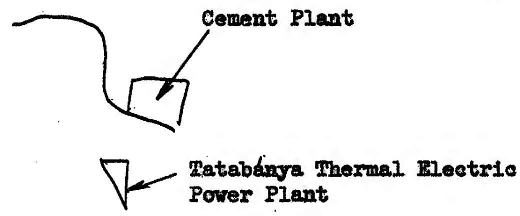
C-O-N-F-I-D-E-N-T-I-A-L

Annex BB

[redacted] 25X1

[redacted] **Pinpoint Location of the Tatabánya Thermal Power Plant (10)** 25X1

[redacted] 25X1



[redacted] 25X1

Map Ref:

Hungary 1:50,000

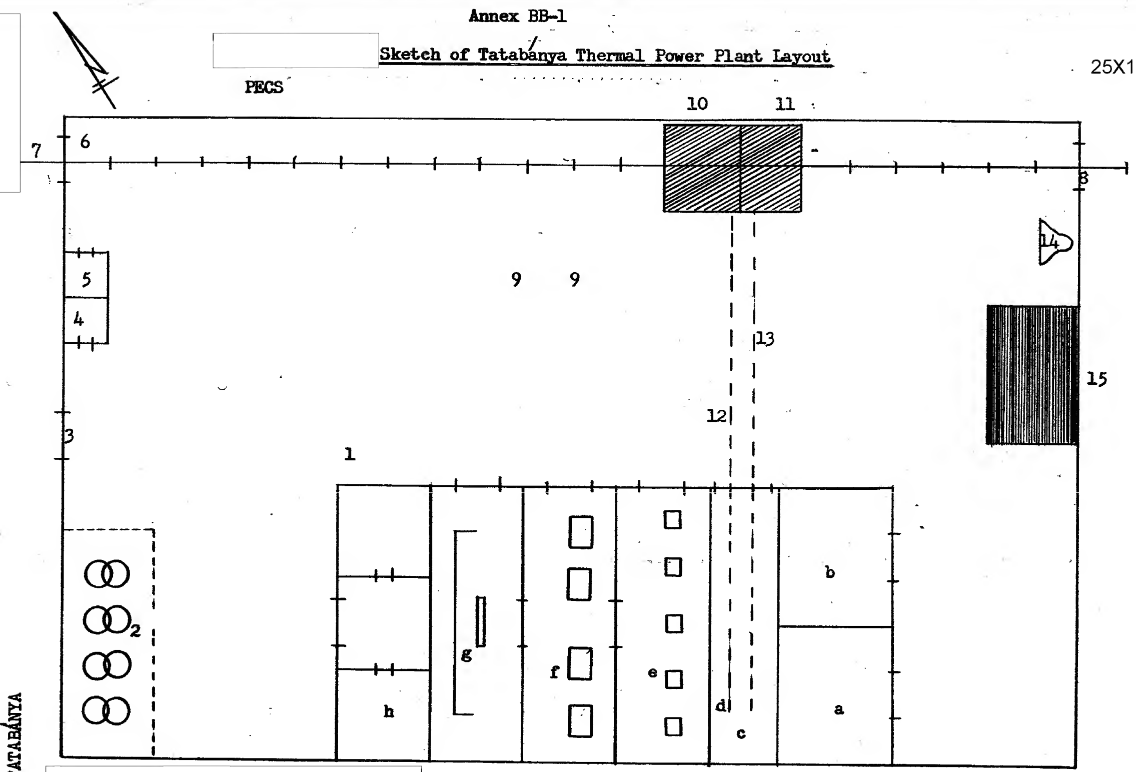
[redacted] 25X1

Annex BB-1

25X1

Sketch of Tatabánya Thermal Power Plant Layout

25X1



C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L

25X1

Legend to Annex BB-1

The Tatabánya Thermal Power Plant was one of the first constructed in Hungary. Its machinery was worn out and the plant operated with frequent breakdowns. However, its transformers and auxiliary equipment were installed in 1947 when the plant was nationalized. The plant covered an area of 700 x 1,000 m; it was surrounded by a brick wall 1.6 m high.

1. Thermal power plant main building 60 x 130 m, two story, inadequate and outdated brick structure, with a hangar type sheet metal roof. There were two rows of skylights, one on each of the long sides of the roof. The basement contained auxiliary equipment. The building contained the following facilities:

   a. Parts room.

   b. Plant's machine repair shop.

   c. Smoke stack, protruding above the building approximately 40 m.

   d. Control point of sheet metal conveyor belt, extending from the coal bunker.

   e. Boiler house with five boilers of unknown foreign origin, each 30 tph at 80 atm, pulverized coal operated.

   f. Turbogenerator house with a heavy overhead traveling crane. It contained four turbogenerators, each 15,000 kw. One or two were produced by Skoda in Czechoslovakia, and the rest were of Zoelly manufacture.

   g. Control house with an instrument board and a control table.

   h. The office rooms occupied by the chief engineer, technical staff and administration section.

2. Open transformer yard, surrounded by mesh wire fence 1.8 m high. It contained four closed oil cooled 15,000 kw transformers.

3. Main entrance, double wing iron door, 4 m wide used by vehicles and pedestrian traffic. The entrance was closed except when in use.

4.and 5. Two buildings, each approximately 4 x 3 x 3 m, brick, flat roof. Building 4 was used by the entrance doorman; building 5 was used by the relief guard.

6. European standard gauge single track rail spur, used in transporting of coal to the plant.

7. and 8. Two iron double wing gates, each approximately four meters wide, closed when not in use. The guard posted at the permanent guard post had the gate keys.

9. Two concrete cooling towers, each 4 m in diameter x 16 m high.

10 and 11. Two bunkers, each 8 x 8 x 8 m, concrete with concrete flat roof, partly underground. Bunker 10 was used for coal; bunker 11 was used for slag.

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex BB-1 (Cont'd)

12. Underground sheet metal conveyor, width unrecalled, used for transporting coal to the pulverizing mill.

13. Underground conveyor, of same type as in item 12 above, used to transport slag.

14. Guard post, covered by sheet metal roof. One guard was continuously posted here.

15. Water tower, 4 x 5 x 8 m, brick, concrete roof. First floor of the building contained an unknown number of unidentified pumps; the second floor contained the water tank.

C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L

Annex BB-2

Tatabánya Thermal Power Plant (10)

1. History

This thermal power plant was one of the first constructed in Hungary, in approximately 1910. The turbogenerators, boilers and their auxiliary equipment were obsolete, and the plant operated with frequent breakdowns. New- Then, transformers and their auxiliary equipment were installed at the time the plant was nationalized. The plant had only one reserve boiler and therefore was the only plant in Number 1 Grid forced to curtail operations for six weeks each year to allow for boiler repair and service. The curtailment of the plant's output caused an extra burden on the other power plants in Number 1 Grid. With the completion of the Tiszapalkonya and the Pécsujhegy plants this plant will be returned to the Tatabánya coal mines as a reserve. No additional equipment or improvements of any type were to be installed in this plant.

2. Generating Units

The plant had four turbogenerators of condenser type, each 15,000 kw, three phase, 50 cycles. One or two were manufactured by Skoda in Czechoslovakia, and the rest were manufactured by Zoelly, country of origin unknown. Date of manufacture of generating units unknown.

3. Boilers

The plant had six boilers, each of 30 tph at 80 atm. The manufacturer of the boilers, which operated on 3,000 kcal/kg pulverized injected coal, was unknown. Due to only one reserve boiler the restrictions stated above were necessary.

4. Water Supply

Ground water from the Tatabánya coal mines was pumped to the plant through an underground pipeline to the water tower and from there via a water treatment unit to the cooling tower.

5. Fuel

[redacted] the plant used approximately 70,000 kg of coal during a 24 hour period. A reserve of 350 to 400 tons of coal was kept in the plant area. 25X1

6. Transformers

The plant had 4 closed, oil cooled 15,000 kw transformers, manufactured by Ganz Electric Plant, BUDAPEST.

7. Transmission

One 110 kv, three phase, 50 cycle line from the plant joined into the Györ high tension line.

8. Manpower

The plant employed 440.

C-O-N-F-I-D-E-N-T-I-A-L

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Annex CC

[redacted]

[redacted] **Approximate Location of the Salgótarján Thermal Power Plant (11)**

25X1

Map Ref:

Hungary 1:50.000

[redacted]

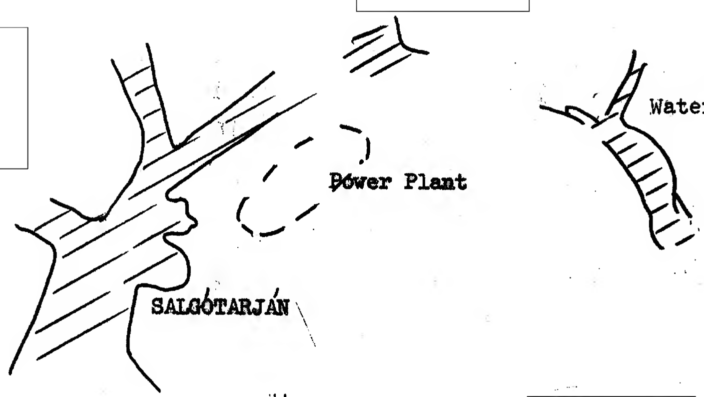
25X1

[redacted]

25X1

[redacted]

25X1



[redacted]

25X1

[redacted]

25X1

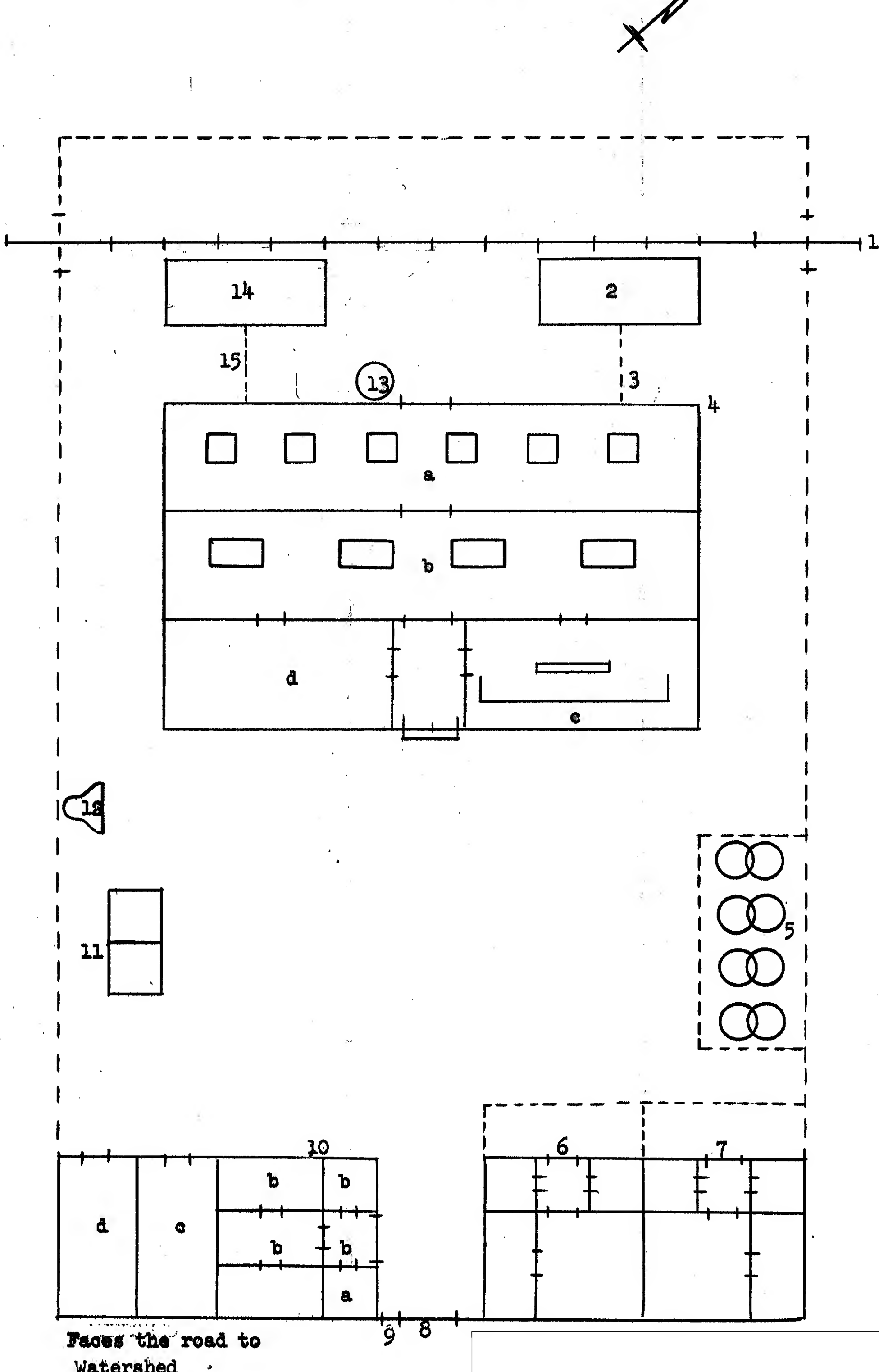
C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L
-118-
Annex CC-1

[redacted]

[redacted] **Sketch of the SALGÓTARJÁN Thermal Power Plant Layout**

25X1



[redacted]

25X1

C-O-N-F-I-D-E-N-T-I-A-L

25X1

[redacted]

Legend to Annex CC-1

The Salgótarján Thermal Power Plant was constructed between 1925 and 1926 [redacted] for the Salgotarjan Rimamurány Steel Mill. 25X1
In 1938 the plant was nationalized by the Horthy regime (Electric Power Plant Trust) and was incorporated into the Number 1 Grid in 1948. The plant covered an approximate area of 900 x 1,400 m; it was surrounded by a barbed wire fence, 2 m high.

1. European standard gauge single track rail line. This line led from the coal mines in the vicinity of Salgótarján, via the local railroad station. It serviced an auxiliary plant of an iron mill then returned via a brick kiln (which used the electric power plants slag) and back to the aforementioned railroad station.

2. Slag bunker, 2 x 4 x 4 m, 2 m below surface and 2 m above, concrete, open top.

3. Sheet metal conveyor, with the sprinkling system above it, transported the slag to the top of the bunker. A moveable rubber conveyor loaded the slag from the bunker into railroad cars.

4. Thermal power plant main building, 60 x 100 m, two story reinforced concrete, flat concrete roof with square skylights. It had a basement air cooling pump condenser. It was divided into the following:

   a. Boiler house, containing six boilers, Cornwall manufactured, each 30 tph at 80 atm, 3,000 kcal/kg, pulverized coal operated. 25X1

   b. Turbogenerator house, with a heavy overhead traveling crane (possibly 25 ton capacity) and four turbogenerators, each 15,000 kw. [redacted] and the other two were of Skoda Czechoslovak manufacture. 25X1

   c. Control house, containing a control board and control table including the high frequency installation. The engineer in charge was able to observe turbogenerators through a glass panel.

   d. Water treatment and pump house with all the plant's pumps (these pumps were installed gradually as the plant was enlarged and were of unknown origin). A warm water storage boiler, 3 m in diameter x 8 m long, with treated water (enough for 24 hour plant operation) was situated on top of the pump house.

5. Open transformer yard, surrounded by a mesh wire fence, 2 m high. It contained four closed, oil cooled, 15,000 kw transformers, manufactured by Ganz Electric Plant, BUDAPEST. One single high tension line led to the Mátra Electric Power Plant transformer yard.

6. and 7. Two houses, each one story with gable tile roof. Each house had two rooms plus kitchen and bathroom. One housed the plant manager, the other the master machinist. Each also had a fenced in garden.

8. Main vehicle entrance, 4 m wide double wing iron door.

9. Main pedestrian entrance, single wing door.

10. Multi-purpose building, 7 x 12 m, one story, brick, gabled tile roof, which contained:

   a. Doorman's house with a doorman continuously on duty. The relief guard stayed in this doorman's house while waiting to go on duty.
   b. Four offices occupied by the plant manager and administration.
   c. Spare parts storage.
   d. Machine repair shop.

Legend to Annex CC-1 (Cont'd)

11. Two water cooling towers, each 4 x 4 x 8 m. Water from the Salgótarján industrial center was pumped via plant's water treating unit into the turbines.

12. Guard post.

13. Smoke stack, approximately 40 m high, brick, on concrete base.

14. Coal bunker, same as slag bunker in item 2 above. A rubber conveyor belt fed coal to pulverizer.

15. Rubber conveyor belt, width unknown.

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Annex CC-2

[redacted]

Salgótarján Thermal Power Plant (11)

1. **History**

This thermal power plant was constructed between 1925 and 1926 from German blueprints by German engineers for the Rimamurány Iron Works in Salgótarján (Salgótarján Rimamurány Vasmű). In 1938 the plant was nationalized by the Horthy regime and incorporated into the Number 1 Grid in 1948. In 1948 ERBE enlarged the transformer yard to 10/110 kv ; reconstructed the control house and installed the carrier communications system; replaced two, five kw turbogenerators with two AEG German turbogenerators; generally overhauled six boilers which included new heating pipes and other unknown repairs. [redacted] the plant as an old, but efficient plant which accomplished its prescribed norm according to schedule. 25X1 25X1

2. **Generating Units**

The plant had four turbogenerators, each 15,000 kw, three phase, 50 cycle. [redacted] two of Skoda, Czechoslovak origin. 25X1

3. **Boilers**

The plant had six boilers, each 30 tph at 80 atm. [redacted] For operation of the boilers 3,000 kcal/kg pulverized coal was injected. 25X1 25X1

4. **Water Supply**

Water from the Salgótarján industrial center was pumped into the plant's water treating unit.

5. **Fuel**

Coal mines in the Salgótarján vicinity shipped coal by railroad via the local railroad station to this plant. [redacted] the plant used 70,000 to 75,000 kg of 3,000 kcal/kg coal during a 24 hour period. The plant had a two-day coal reserve. 25X1

6. **Transformers**

The plant contained four closed, oil cooled transformers, manufactured by Ganz Electric Plant, BUDAPEST.

7. **Transmission**

One 110 kv, three phase, 50 cycle line led from this plant to the Matra Power Plant's transformer yard.

8. **Manpower**

The plant employed 420 people.

9. **Miscellaneous Information**

During the summer of 1954 an unknown person threw three pieces of soft brown soap over the fence and into the plant's cooling tower, deactivating the plant for two weeks. [redacted] the plant was later nicknamed the "Soap Bubble" plant. [redacted] an investigation was carried out, but the culprit was never 25X1

C-O-N-F-I-D-E-N-T-I-A-L

[redacted] 25X1

Annex CG-2 (Cont'd)

apprehended. From that time on all the plants of Number 1 Grid had at least one continuous guard post guarded by blue uniformed civilians, armed with rifles, supervised by the AVH. [redacted] plants were only guarded from that date on by AVH including the Mátra Power Plant.) [redacted] the possible culprit was a former disgruntled worker, who was well acquainted with the plant. [redacted] the AVH started to investigate [redacted] aforementioned theory, but had to give up since there was a constant turnover of workers at this plant. 25X1

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Annex DD

[redacted]

[redacted] **Location of the Pécsujhegy Thermal Power Plant (12)**

25X1

Legend

1. Thermal power plant's approximate location.
2. Road, asphalt, four meters wide, in good condition.
3. European standard gauge railroad line.
4. Town limits of PÉCS.

25X1

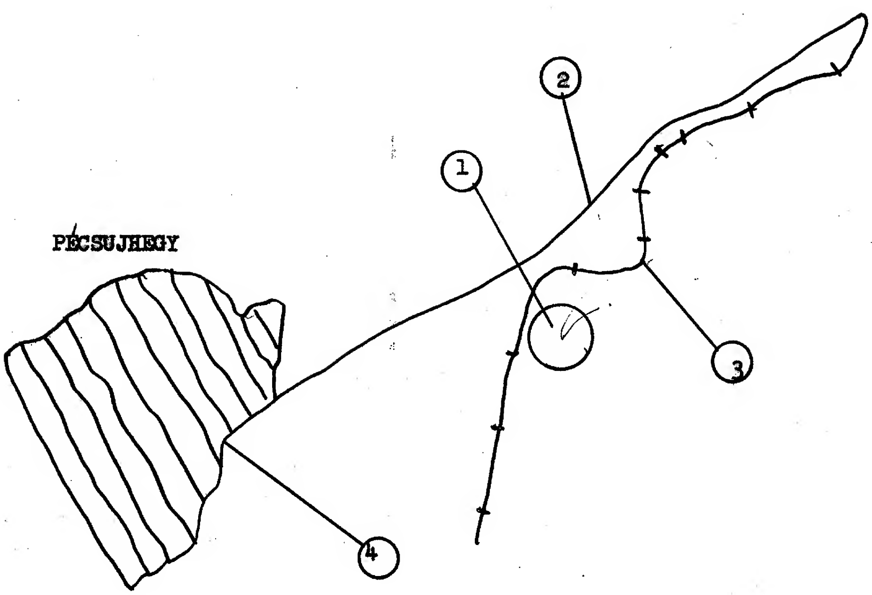
[redacted]

Map Ref:

Hungary 1:50,000

[redacted]

25X1



[redacted]

25X1

C-O-N-F-I-D-E-N-T-I-A-L

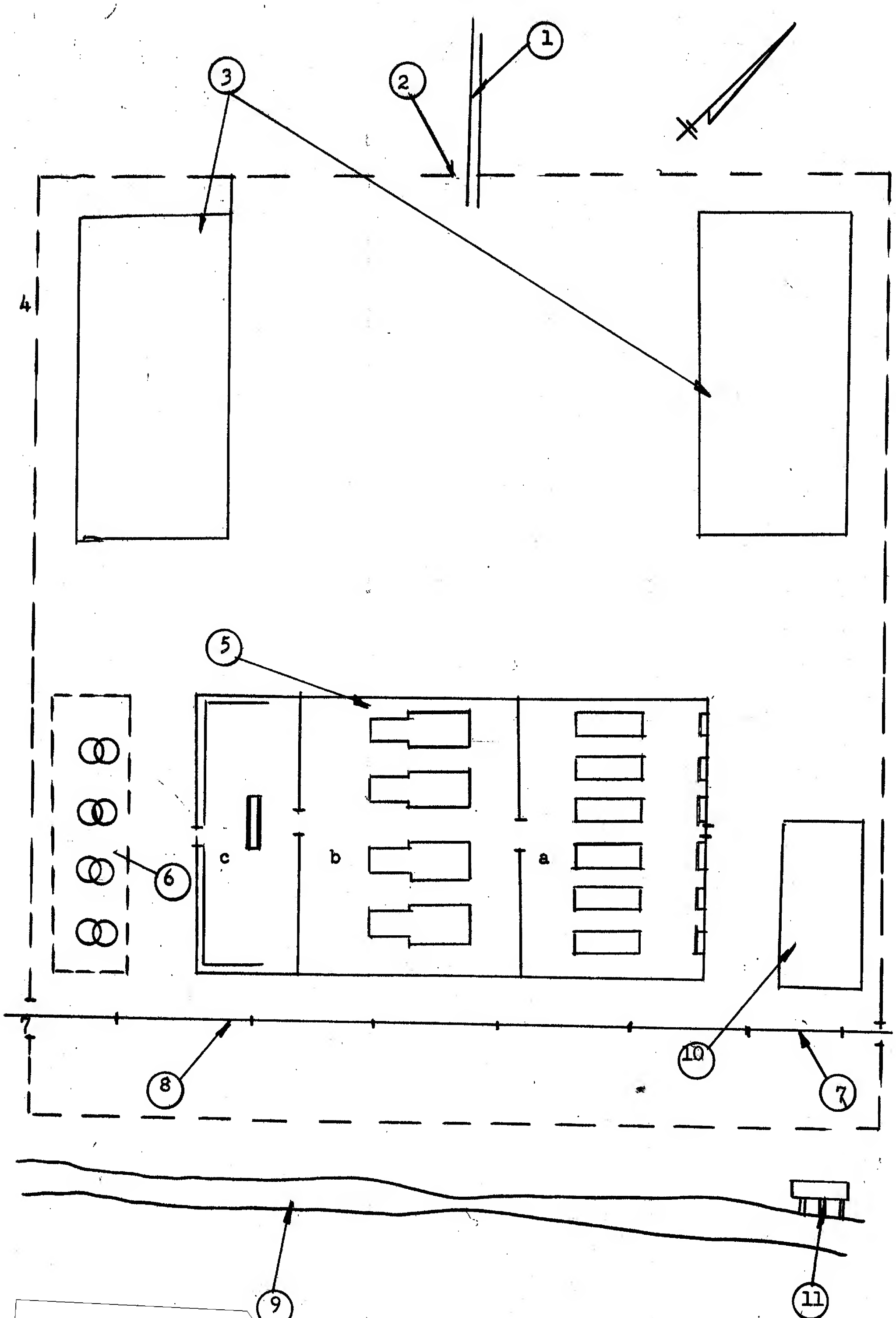
25X1

C-O-N-F-I-D-E-N-T-I-A-L

Annex DD-1

Sketch of the Pécsujhegy Thermal Power Plant Layout

25X1



C-O-N-F-I-D-E-N-T-I-A-L

25X1

25X1

Legend to Annex DD-1

1. Road connecting plant area with asphalt road, built in 1955.

2. Gate, a double wing, steel door, four meters wide.

3. Administration buildings, size and construction unrecalled.

4. A two-meter-high brick wall.

5. Power Plant Building, size unrecalled. The building contained the following:

   a. Boiler house, to contain after completion, six boilers, each of 20 tph, 80 atm, with an attached coal mill, coal riser, coal conveyor installation and a slag conveyor, and six caloric control boards to control the function of the six boilers.

   b. Turbine house, to contain after completion, four turbogenerators, horizonally arranged, each 15,000 kw.

   c. Control house, to contain after completion, turbogenerator control switchboard along all four walls, and a control desk, from which the entire electrical function of the plant was to be controlled.

6. Transformer yard, size unrecalled, was enclosed by mesh wire fence, supported by steel posts about two meters high, inside of which four transformers were to be installed, each 15,000 kw; they were to be connected by underground cables to the control house.

7. Two railroad gates, double wing, steel doors, each about four meters wide.

8. Railroad spur, European standard gauge, not shown on the map, was built in 1955.

9. Meszes brook (Kenesz-Patak).

10. Water pump, size unrecalled. This pump was to supply the plant with water from a deep well.

11. Purification plant and filter house.

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Annex DD-2

[redacted]

Pécsujhegy Thermal Power Plant (12)

1. History

Construction of the Pécsujhegy Thermal Power Plant was included in the first Five Year Plan (1951 - 1956), but approval for its construction was contained in the second Five Year Plan (1957 - 1962). This plant was to replace the old power plant in PÉCS. The turbo-generators, boilers and auxiliary equipment were delivered [redacted] and were intended for the construction of a power plant in NAGYBANYA (BAIA-MARE) which was then a part of Hungary but is now in Rumania. The equipment was stored during WW II at unknown places. The plant was planned and constructed by ERBE. At a secret meeting of the Ministry of Mines and Power Plants [redacted] on 18 August 1956, [redacted] the projected new thermal power plant in Pécsujhegy, [redacted] Upon the occasion of the final technical installation, scheduled for 1 December 1962, the plant was to operate within the Number 1 High Capacity Power Grid (110 kv). 25X1

2. Ownership

This plant was state owned, under the administration of the Ministry of Mines and Power Plants, BUDAPEST 5, Markó Utca 16, and under the immediate administration of the Power Plant Trust, BUDAPEST 1, Iskola Utca 13.

3. Production Data

Power production was scheduled to start on 1 December 1957, 15,000 kw capacity (one turbogenerator in operation). A constant 60,000 kw/hr was to be maintained after December 1962.

4. Generating Units

The plant was to contain four turbogenerators, each having a capacity of 15,000 kw, generating 110 kv, three phase, and 50 cycle. The turbogenerators were manufactured and delivered [redacted] sometime in 1938. 25X1

5. Boilers

The power plant was to have six boilers installed, each 20 or 25 tph and 60 atms. They were of the BW type, using the injection system of firing with pulverized coal of about 3,000 kcal/kg. Each boiler had an economizer with by-pass flow, a smoke-gas ventilator, a coal pulverizer with scale, a cinder vacuum pump, an electric boiler feed and a steam boiler feed. One of each of the above mentioned items of equipment was in reserve.

6. Water Supply

The source of water supply was the Kenesz (Meszes) Brook. A dam was scheduled to be constructed on an unidentified location on the river. A coke and ballast filter was to be used for water treatment. [redacted] 25X1

7. Fuel

The fuel for the plant was supplied by the surrounding coal mines and from the waste material of the nearby briquet factory which was constructed in 1954, about one kilometer north of the power plant. The mixed coal had a 3,000 kcal/kg value. It was to be delivered by rail. The handling equipment's

C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L

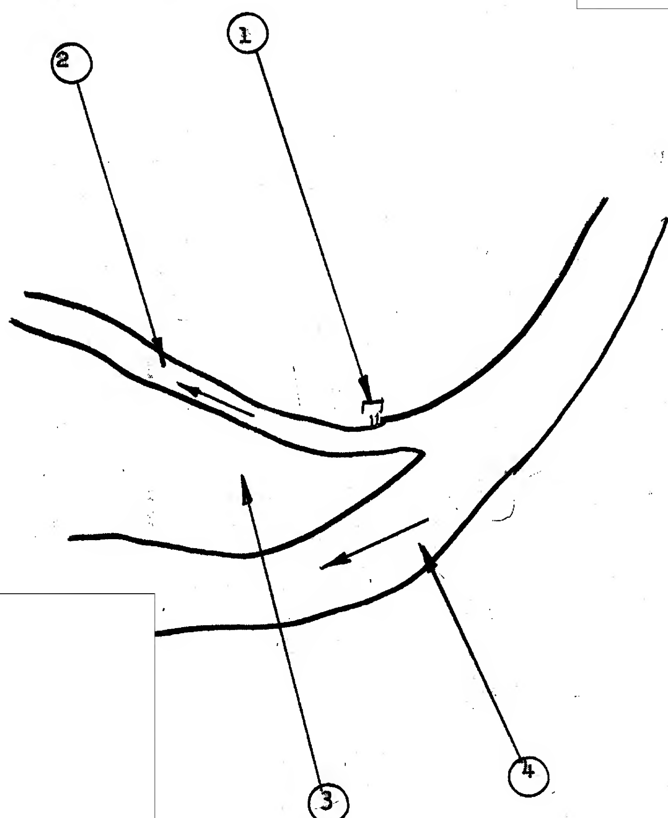
Annex EE

Pinpoint Location of the Visegrád Hydroelectric Power Plant (13)
(Under construction)

25X1

Legend

1. Visegrád Hydroelectric Power Plant.
2. Szentendre Branch of the Danube River.
3. Szentendre Island.
4. Danube River.



25X1

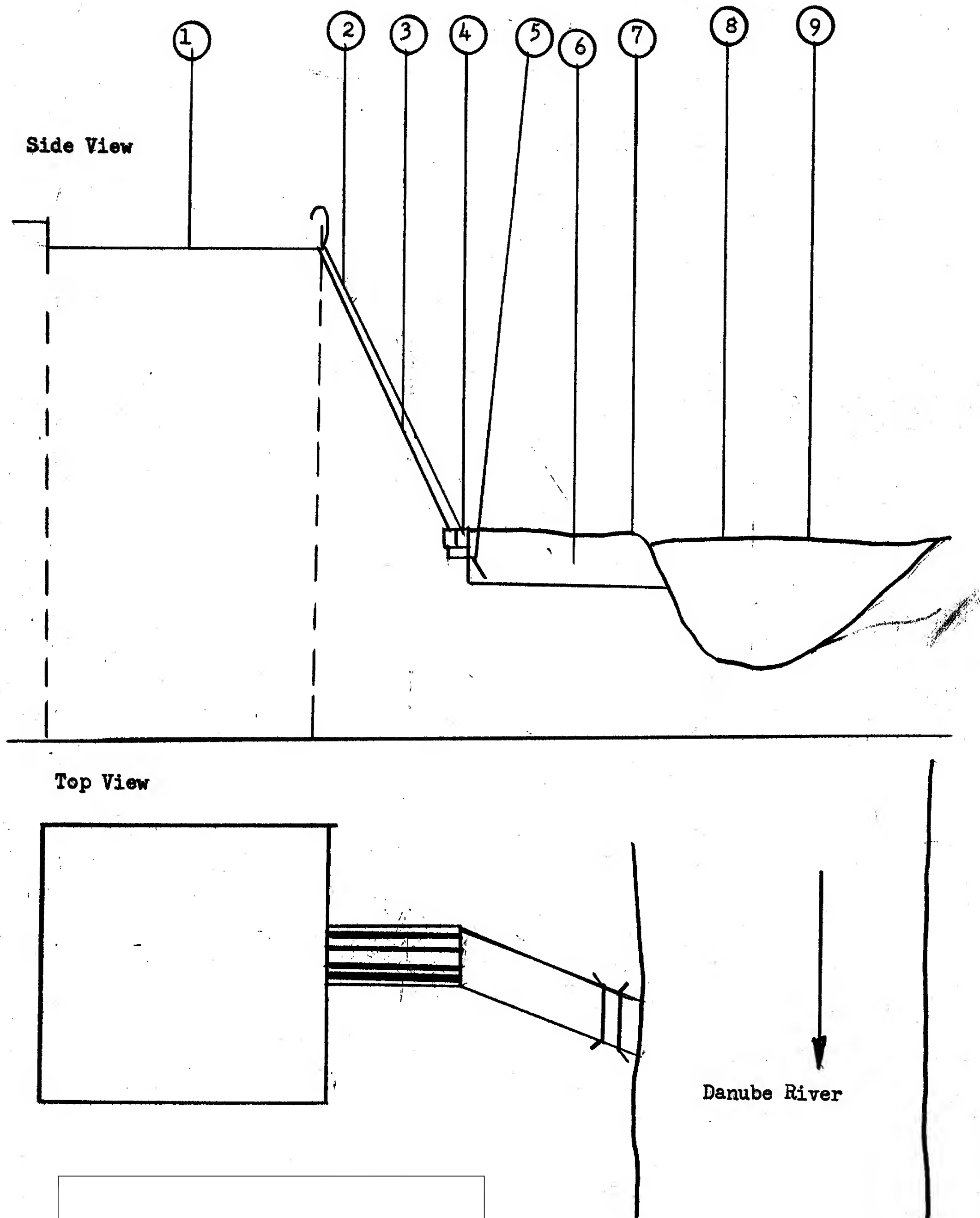
Map Ref:

Scale 1:50,000

C-O-N-F-I-D-E-N-T-I-A-L

Annex EE-1

Sketch of the Top and Side View of the Visegrád Hydroelectric Power Plant (13) (Under construction)



25X1

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex EE-1

1. Water reservoir, of reinforced concrete, dimensions unknown. The reservoir was located on a 100-meter-high hill and was supplied with water from the Danube River.

2. Four water pipes, each about 120 m long; they conducted the water from the canal, item 6 below, to the water reservoir.

3. Four penstocks, each about 120 m long, laid parallel to the water pipes. The penstocks supplied the turbines with water from the reservoir.

4. Hydroelectric power plant, to be constructed of reinforced concrete, dimensions were unknown. The plant was to contain the following:

   a. Turbine house, with four turbogenerators, vertically arranged, 5,000 kw each.

   b. Pump house, with four electrically powered water pumps, each with a capacity of 8,000 liters per minute to supply the reservoir.

5. Four turbine outlets, size unrecalled.

6. Canal, of reinforced concrete, "V" shaped, about 80 m long and 4 m wide at the top. It connected the power plant with the Danube River, built at approximately 45° to the river branch.

7. Bridge, concrete, about 20 m long and 6 m wide; it spanned the canal, item 6 below, and connected the Visegrád-Budapest road.

8. Water level of the branch of Danube River (see item 2, Annex EE).

9. Branch of the Danube River (see item 2, Annex EE).

C-O-N-F-I-D-E-N-T-I-A-L

25X1

Annex EE-2

Visegrad Hydroelectric Power Plant (13)

1. General Information

Because of insufficient electric power in Hungary especially during peak hours, due to industrial operations and consumer consumption, it was planned during the first five-year plan (1951-1956) to construct a peak power plant near VISEGRÁD on the Danube River. Excavation work began in the middle of 1956; construction work began in January 1957. The plant was to be completed at the end of the second five-year plan, in December 1962. The plant's construction was suggested by the Electric Power Trust. Its operation was to be economical; it was at one time planned that a two man crew would operate the entire plant for the Budapest Municipal Electrical System (PHOEBUS). [redacted] Originally, this power plant was to be constructed on Lake Balaton; its location was changed to VISEGRÁD because of the shorter transmission lines to the Népliget Power Sub-station in BUDAPEST. This peak power plant was to be integrated into the Number 1 High Capacity Power Grid. 25X1

2. Water Supply

Water supply for the plant was to be derived from the Danube River. A canal was constructed at an angle to the river to eliminate the flow of silt into the pump house. The canal, constructed of reinforced concrete in a "V" shape, about four meters wide at the top and about 80 meters long; no further information was available. The water level in the canal was to be the same as that of the Danube River. Four centrifugal, electrically driven water pumps, manufactured by the Lang Machine Factory in BUDAPEST, pumped the canal water to a reservoir located on a 100-meter-high hill. It took the four pumps eight hours of continuous operation to fill the reservoir, while it was to take four hours for this water potential to be utilized by the turbines at a steady output of 20,000 kw per hour. The prime mover for each pump was a 500 hp electric motor and two 100/10 kv step-down transformers. Eight steel pipes, each about 120 meters long (further specifications unknown), carried the water to the reservoir which was made of reinforced concrete; dimensions were unknown. The water was carried to the turbines and back to the canal through four penstocks.

3. Turbogenerator Sets

The four "Francis" type turbines were manufactured by the Lang Machine Factory; this type of turbine was formerly manufactured by the Pol Machine Factory in SZOMBATHELY. Each was to be 5,000 kw capacity and 10 kv. The four generators were to be manufactured by the Ganz Electric Control Equipment Company, BUDAPEST; each of 5,000 kw, three phase, 50 cycle. The generators had circulating coolers.

25X1

4. Transformers

The transformers were 10/110 kv, 3 phase, 50 cycle, with rib type oil coolers. The transformers had star and delta connections (star on the 10 kv side and delta on the 110 kv side). They were located in a yard (uncovered).

5. Transmission

The transmission lines, 110 kv, led to the present peak power plant of the Budapest Municipal Electrical System, which already had direct transmission lines to the Main Power Sub-station in the Nepliget sub-station in BUDAPEST. The lines were overhead, made of aluminum, cross-section 60 sq mm, and were suspended on 50-centimeter-long, porcelain chain insulators from 16-meter-high steet towers.

C-O-N-F-I-D-E-N-T-I-A-L

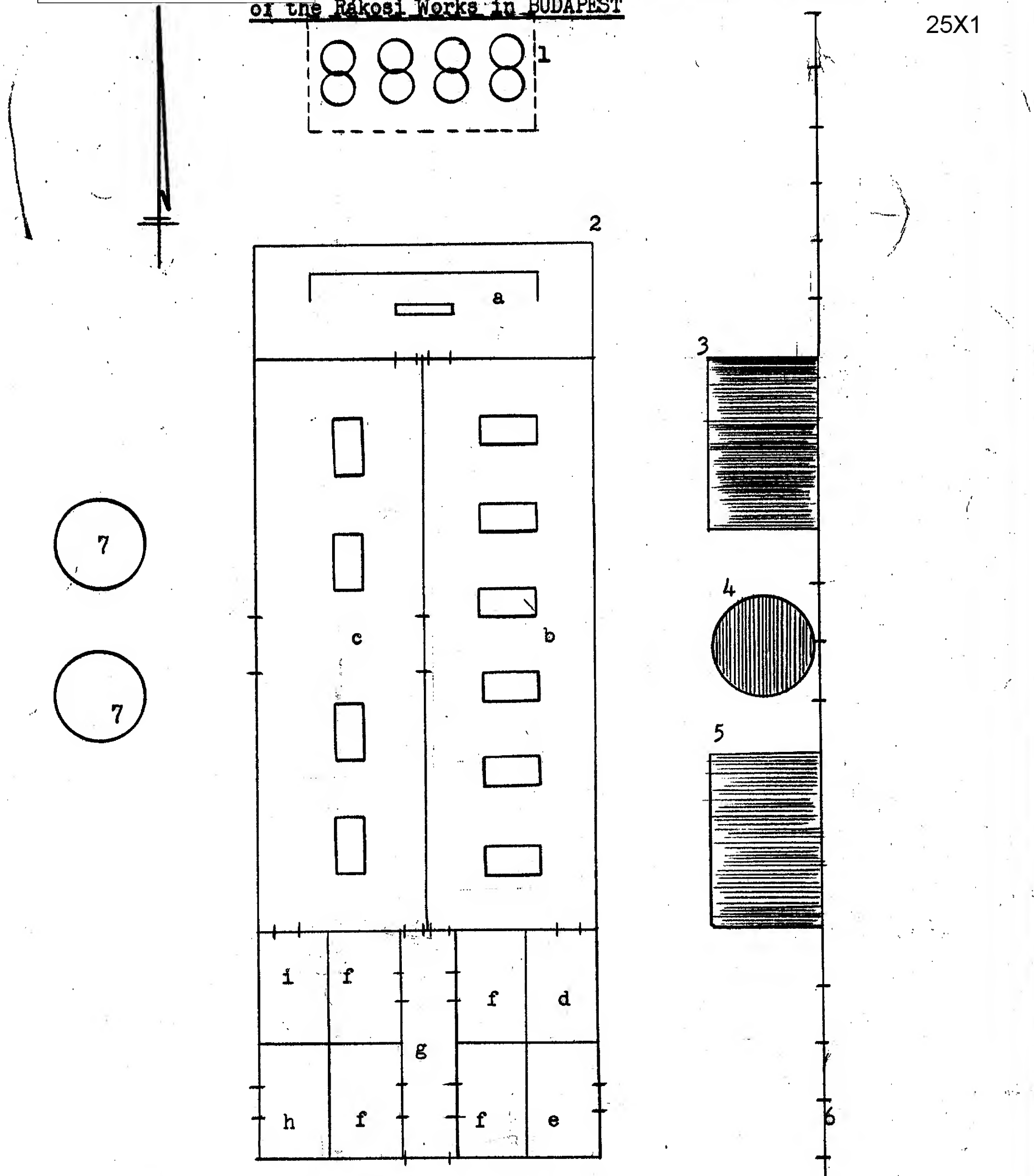
-133-

Annex FF

[redacted] 25X1

[redacted] Sketch of the Csepel Thermal Power Plant (14) of the Rákosi Works in BUDAPEST

25X1



NOTE: For pinpoint location see Annex V.

[redacted] 25X1

BUDAPEST

C-O-N-F-I-D-E-N-T-I-A-L

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex FF

25X1

This plant was originally constructed as the Weiss Manfred Machine Plant, date unknown. As soon as the Communists came to power in 1948 the plant was completely reconstructed and new equipment and machines were installed. [redacted]

1. Open transformer yard surrounded by a mesh wire fence, 2 m high. It contained four 15,000 kw, 10/110 kv, oil cooled transformers. Only the 20,000 kw for Number 1 Grid was stepped up to 110 kv; the remaining 40,000 kw was delivered to the Rákosi Works at 10 kv and stepped down to usable voltage there.

2. Thermal power plant main building, 60 x 180 m, 2 story, reinforced brick structure, gabled (irregular) roof with skylights. Three smoke stacks, each 1.5 m in diameter and 6 m high protruded from the roof, above the boiler house. The building contained the following facilities:

    a. Control house containing an instrument board and a control table.

    b. Boiler house with six boilers, each 25 tph at 60 atm, mixed fuel type (gas and 3,000 kcal/kg coal).

    c. Turbogenerator house with a heavy overhead traveling crane (possibly 25 ton capacity). It contained four turbogenerators each of 15,000 kw capacity.

    d. Water treating unit and reserve water tanks; seven pumps of unknown make and capacity fed treated water to the boilers.

    e. Plant spare parts storage.

    f. Four offices, occupied by the plant manager and his staff.

    g. Main entrance to this building, unguarded. It had a sign "Entrance for unauthorized persons strictly prohibited".

    h. Plant machine shop.

    i. Laboratory.

3. Slag bunker, 4 x 6 x 8 m, concrete; railroad cars were loaded by retractable chutes.

4. Gas tank (telescopic gas holder), corrugated sheet metal, 6.5 m in diameter x 10 m average height.

5. Coal bunker, same size and appearance as slag bunker in item 3 above. It had a coal weighing bridge and coal car dumping device. Thirty freight car (each of 10 ton capacity) loads were kept on reserve in this coal bunker.

6. European standard gauge railroad track of the Rákosi Works rail net.

7. Two concrete water towers, each 3 m in diameter x 12 m high, with built-in circulation water pumps; they serviced the four turbogenerators of the plant (each serviced two turbogenerators).

C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L

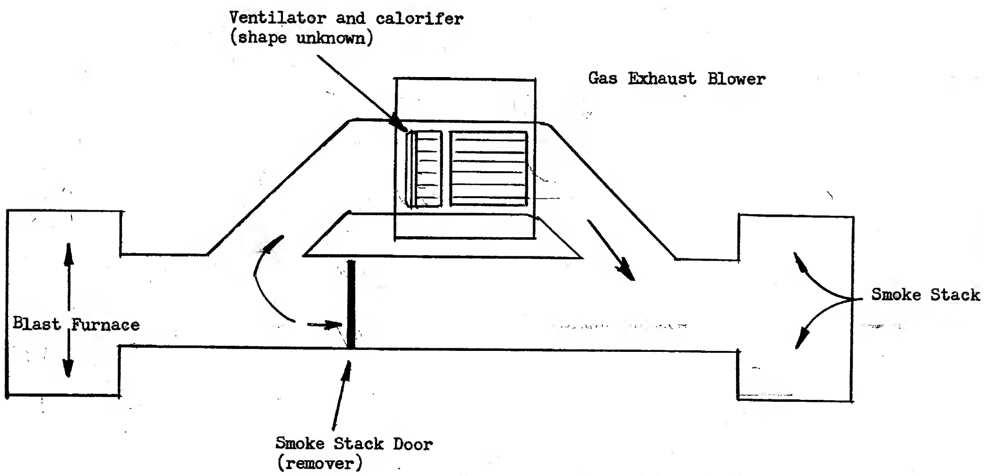
-135-

Annex FF-1

Waste Gas Feeding Device Used for Operation of Boilers at the Csepel Thermal Electric Power Plant at the Rákosi Works

25X1

25X1



25X1

C-O-N-F-I-D-E-N-T-I-A-L

25X1

C-O-N-F-I-D-E-N-T-I-A-L

Annex FF-2

[redacted]

Csepel Thermal Power Plant (14) at the Rákosi Works in BUDAPEST

1. History of Plant

Between 1948 and 1952 ERBE stripped an old plant to its bare walls and rebuilt and equipped it with new turbogenerators, boilers, transformers, fuel systems, including all auxiliary parts, [redacted] 25X1

2. Ownership

This plant was completely independent from Number 1 Grid and was controlled by the Rákosi Works. The plant's only responsibility was to furnish 20,000 kw electricity to Number 1 Grid. [redacted] only in 25X1 emergency the plant would fall under Number 1 Grid's supervisions, otherwise its supervision fell under Number 2 Grid.

3. Primary Function and Use

This was a baseload plant. The principal user of its electric power was the Rákosi Works with 40,000 kw and the secondary user was Number 1 Grid with 20,000 kw. The plant's continuous production since 1952 was 60,000 kw.

4. Generating Units

The plant had four turbogenerators each 15,000 kw, 50 cycle. The turbines were manufactured at the Lang Machine Plant, and the generators at the Ganz Electric Plant, both in BUDAPEST.

5. Boilers

The plant had six boilers, each 25 tph at 60 atm. All were manufactured by the Ganz Ship Plant, Boiler Department, BUDAPEST. The boilers could either be fueled with waste gases from the Csepel Works blast furnaces or with 3,000 kcal/kg pulverized injected coal. [redacted] this plant was fueled with waste gases since 1952. [redacted] 25X1 a calorifer (water pipe coil) was built in the duct of the blast furnace (roughly 4 x 4 m in size) leading to the smoke stack in which water for the boilers was preheated. Between the calorifier and smoke stack a metal separator was built in which separated smoke from burnable gases, the gas was then pumped through a duct by a vacuum feed to the power plant's gas tank. From the gas tank the gas was fed into the boiler furnaces. [redacted] there 25X1 was always sufficient burnable gas available and that boiler life was extended by using 70 degrees to 80 degrees centigrade water through the calorifer instead of 18 degrees centigrade feed water.

C-O-N-F-I-D-E-N-T-I-A-L

Annex FF-2 (Cont-d)

6. Water Supply

The water was supplied from the Rákosi Works water system (location and details unknown) via the power plant's water treating unit, to the turbogenerators and from there to the cooling towers. One cooling tower served two turbogenerators.

7. Fuel

The plant kept a coal reserve of 300 tons in its coal bunker. The coal was furnished by the Coal Distribution Trust, BUDAPEST; it was brought to the plant via the European standard gauge net of the Rákosi Works.

8. Transformers

The plant had four closed oil cooled, 15,000 kw, 10/110 kv, each transformer, 50 cycles and three phase. The voltage connections were of star type.

9. Transmission

One 110 kv line entered plant from the Kelenföld power plant. One line led to the Népliget Central Transformer Yard.

10. Manpower

The plant employed 460 persons; all were paid by the Rákosi Works. [redacted] a large number of above were only employed in case of emergency when the boilers have to be operated by coal.

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25X1

C-O-N-F-I-D-E-N-T-I-A-L

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Annex GG

Pinpoint Location of the Sztálinváros Thermal Power Plant (15)

25X1

Legend

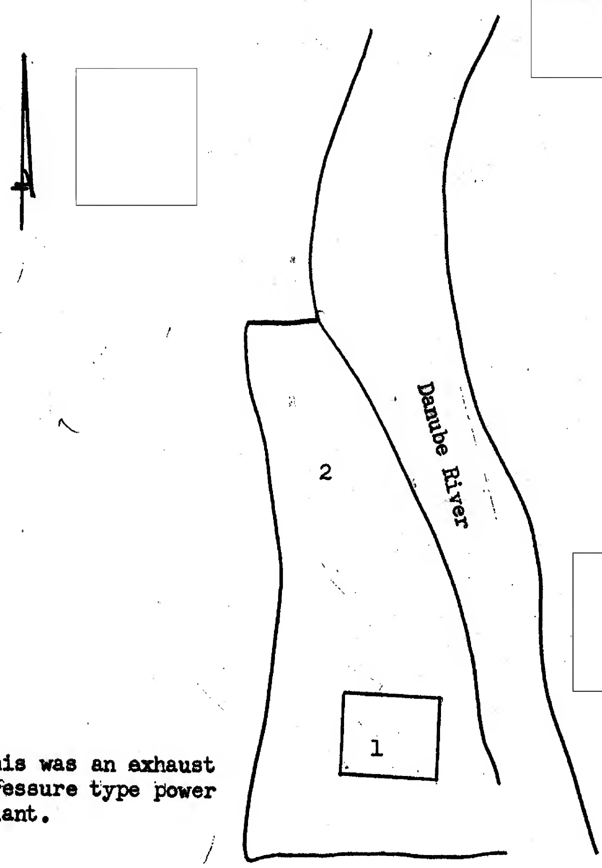
1. Sztálinváros Thermal Power Plant
2. Sztálinváros Combine

Map Ref:

Hungary 1:50,000

25X1

25X1



25X1

NOTE: This was an exhaust pressure type power plant.

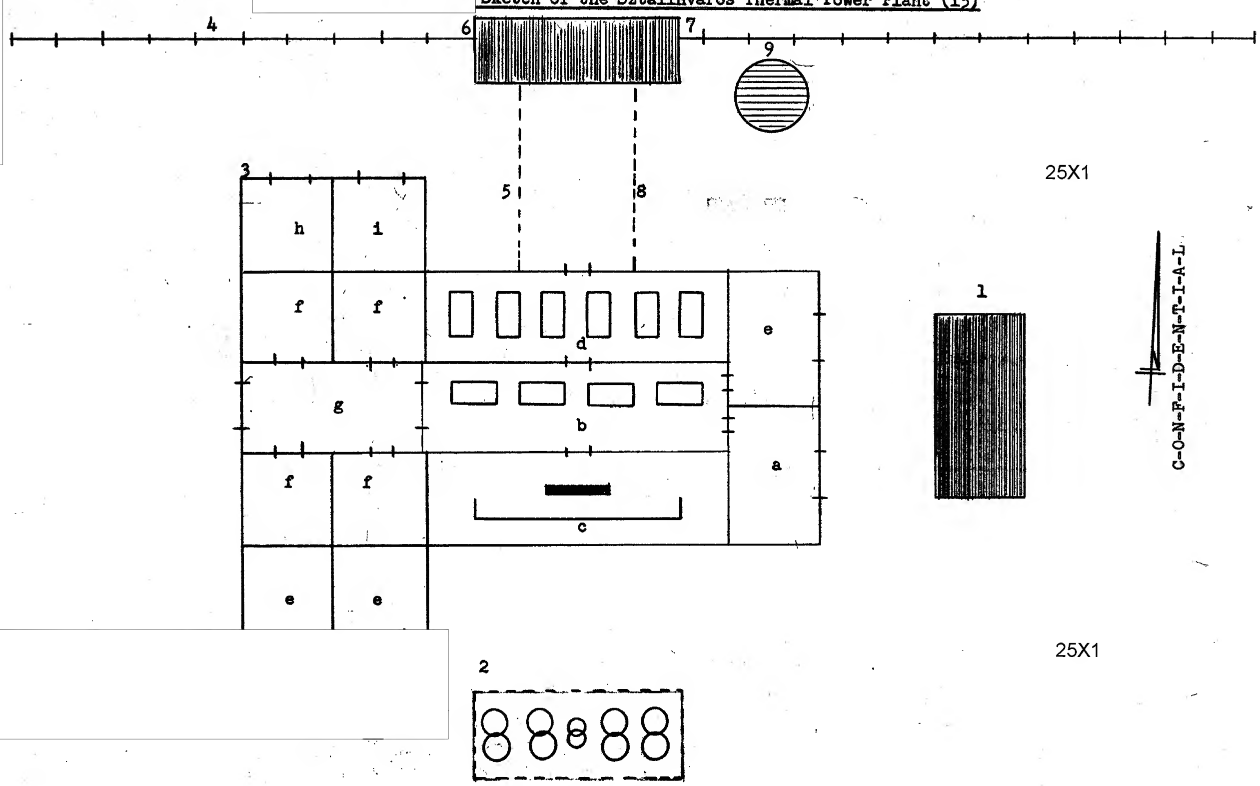
25X1

C-O-N-F-I-D-E-N-T-I-A-L

Annex GG-1

25X1

Sketch of the Sztálinváros Thermal Power Plant (15)



25X1

25X1

C-O-N-F-I-D-E-N-T-I-A-L

-139-

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex GG-1

25X1

The Sztálinváros Thermal Power Plant of the Sztálinváros Combines was constructed between early 1949 and the fall of 1952. This plant has no cooling tower because the exhaust steam was used for central heating. [redacted] unable to determine the size of the plant since its buildings were spread over a large area, and he could not recall the distance between buildings.

1. Water tower with water treatment unit, 5 x 8 x 8 m, concrete, concrete flat roof. Upper part was water tank, the lower section contained the water treating unit and pumps.

2. Open transformer yard surrounded by a mesh wire fence. It contained four 15,000 kw, closed oil cooled transformers.

3. Thermal power plant main building, T-shaped, short side 100 x 150 m, long side 120 x 150 m, concrete reinforced building with hangar type roof with skylights along its long side. Three sheet metal smoke stacks, each 1.5 m in diameter x 6 m in height, protruded from the roof above the boiler house. It was divided into the following facilities:

   a. Plant spare part storage.

   b. Turbogenerator house, with heavy overhead traveling crane (possible 25 ton capacity). It contained four turbogenerators each of 15,000 kw capacity.

   c. Control house, containing an instrument board and a control board.

   d. Boiler house, containing six boilers, 25 tph at 60 atm, mixed fuel type (gas and 3,000 kcal/kg coal.

   e. Sztálinváros Combine Transformer Station (equipment unobserved).

   f. Four offices, occupied by the plant manager and his staff.

   g. Entrance to building was unguarded and open, but had a sign on the outside reading "Entrance for unauthorized persons is strictly prohibited".

4. European standard gauge railroad track of the Sztálinváros Combine rail net.

5. Underground coal conveyor belt, size and type not known.

6. and 7. Coal and slag bunkers 12 x 20 x 10 m (6 m above and 4 m below the ground). Coal cars were weighed on weighing bridge and then dumped into the bunker which was 4 m below the surface. The slag bunker was 6 m above the railroad track and slag was loaded into the coal cars after they had dumped their coal.

8. Underground slag tubes through which slag was sucked into slag bunker.

9. Gas tank, (telescopic gas holder), sheet metal, 6.5 m in diameter x 10 m average height.

C-O-N-F-I-D-E-N-T-I-A-L

Annex GG-2

The Sztalinvaros Thermal Power Plant (15)

25X1

1. History

This power plant was constructed between early 1949 and the fall of 1952. When completed it was immediately put into operation by the ERBE. [redacted] This plant was the most efficient in Hungary since it used its exhaust steam for heating the Combine and the city of Sztálinváros (estimated population of 35,000). This plant also used waste gas of the Combine's blast furnaces to operate its boilers, and used pulverized coal in its injection system only in emergencies. This plant belonged to Number 2 Grid system and had no carrier communication system.

2. Ownership

This plant was completely independent of the National Power Grid System and was only controlled by the Sztálinváros Combine. The plant's only responsibility to the Number 1 Grid was to furnish 20,000 kw electricity. [redacted] only in emergency would the plant with its full production of 60,000 kw fall under Number 1 Grid supervision. 25X1

3. Primary Function and Use

This is a baseload plant. The principal user of its electricity was the Sztalinváros Combine which used 40,000 kw.

4. Generating Unit

The plant had four turbogenerators, each 15,000 kw, 10 kv, 50 cycle. The turbines were manufactured at the Lang Machine Plant, and the generators at the Ganz Electric Plant, both located in BUDAPEST.

5. Boilers

The plant had six boilers, each 25 tph at 60 atm. These boilers also were manufactured at the Ganz Ship Plant, Boiler Department, BUDAPEST. They were operated on the same principle as the boilers of the Csepel Thermal Electric Power Plant. The boilers were fueled by either burnable waste gases of the Sztálinváros blast furnaces or with 3,000 kcal/kg pulverized injected coal. See Annex FF-1 which shows the device used for feeding waste gas to the boilers.

6. Water Supply

Water was pumped from the Danube River to the water tower which contained the water treating unit and from there the water was fed into the boilers.

7. Fuel

The plant received 3,000 kcal/kg coal by an overhead bucket conveyor belt system from the Komló and Pécs mines. The amount of reserve held in the plant was unknown.

8. Transformer

The plant had four closed, oil cooled 15,000 kw, 10/110 kv, 50 cycle, three phase transformers. The voltage connections were of the star type.

C-O-N-F-I-D-E-N-T-I-A-L

[redacted]

The Sztalinváros Combine used 220 and 350 Volt AC current. The local transformer was located within the thermal power plants main building.

9. Transmission

One 110 kv line entered the plant from Szeged. One 110 kv ran from from the power plant to the Népliget transformer yard.

10. Manpower

The plant employed approximately 650 persons. This comparatively high number of employees was explained [redacted] as the need for stand-by workers to operate the coal and slag unloading and loading system in case of emergency.

11. Miscellaneous Information

[redacted] the central heating system was ill planned and the entire Sztálinváros Combine and city piping system had to be enlarged. [redacted] heating of aforementioned places was delayed by this shortcoming.

[redacted]

Annex HH

[redacted] Pinpoint Location of Szeged Thermal Electric Power Plant, Referred to Officially as Number 14, Condenser Type Power Plant

25X1

Map Ref:

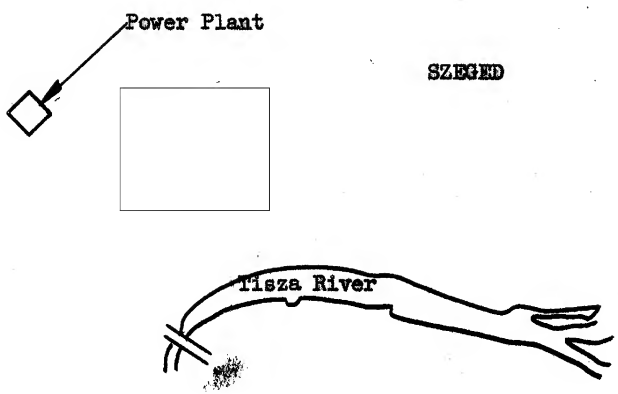
Hungary 1:50,000

[redacted]

25X1

[redacted]

25X1



25X1

[redacted]

25X1

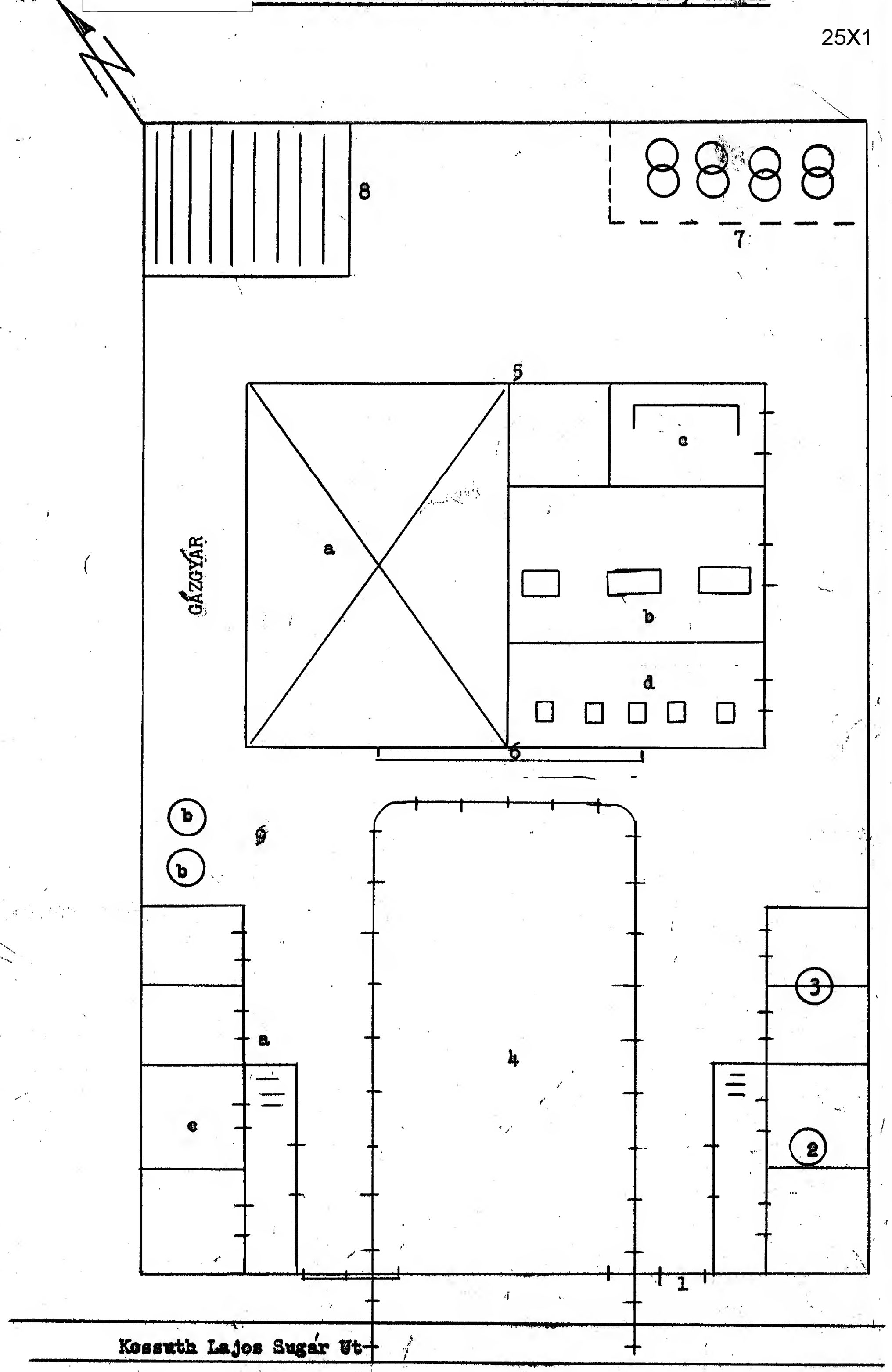
C-O-N-F-I-D-E-N-T-I-A-L

Annex II

[redacted]

Sketch of Thermal Electric Power Plant, SZEGED

[redacted] 25X1



[redacted] 25X1

C-O-N-F-I-D-E-N-T-I-A-L

C-O-N-F-I-D-E-N-T-I-A-L

Legend to Annex II

The plant covered an area of 400 x 600 m. It was enclosed by a mesh wire fence. The plant area was jointly occupied by the electric power plant and the city illuminated gas plant.

1. Plant entrance.

2. Office of the power plant occupied by the plant manager and his staff.

3. Machine shop and parts storage.

4. European standard gauge railroad track, part of the city streetcar net, used during night time for coal transport to this plant.

5. Main thermal power plant building, 30 x 60 m, two story, reinforced brick building. Half of the building (item 9a) was occupied by the machines of the illumination gas plant; it had a high gabled roof largely consisting of skylights. It contained the following facilities:

   a. Boiler house containing five unidentified boilers, each 5 tons of steam per hour, 35 atm, traveling grate types.

   b. Turbogenerator house containing three turbogenerators of unknown make of 14,000 or 16,000 kw capacity.

   c. Control house containing an instrument board and an instrument control table.

   d. Carrier communication system which was used only to direct and control the open transformer yard of this plant. A transformer which transformed 5 kv into 35 kv was located in the basement below the carrier communications system.

6. Coal chute.

7. Open transformer yard containing two 30,000 kw and two 15,000 kw transformers. Thirty-five kv was transformed into 110 kv. [illegible]

8. Concrete water tower, 4 x 5 x 10 m. Water from the Tisza River was pumped into this tower and used by both plants (power and gas plant). The tower contained unidentified pumps and the water treating unit.

9. Premises of the illumination gas plant. In appearance this plant was the same as the power plant except for two gas storage tanks.

   a. Main plant structure.

   b. Two illumination gas tanks.

   c. Gas plant office building.

C-O-N-F-I-D-E-N-T-I-A-L